Design & Technologies for Facilitating Events in Retirement Communities

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OVERVIEW

INTRODUCTION

Great opportunity lies in designing products for the elderly due to the fact that the users, the people users interact with, and their environments cause problems which could be solved with design that is tailored to their needs. Looking at the environment of senior housing facilities, issues of boredom and isolation rise to the forefront. These issues can be resolved by increasing social interaction amongst the residents. In attempts to bring people with common interest together, many senior housing facilities have various group events. Currently these events are coordinated by a single entity and are advertised using archaic methods. In one such facility the only bulletin board hangs by the main lobby with hopes that its residents will travel by it at least once and see the events of the month. Events are posted by an event coordinator and compete for visual attention amongst other information such as advertisements and health newsletters. If users are interested in an event they have to filter the overflowing information and in some cases use a reading aide like a magnifier that is hung up by the board. In addition to the bulletin board, the event coordinator generates a calendar of events that the facility slips under each resident's door. This once-a- month reminder might make it difficult for residents to remember events towards the end of the month. Finally, the last place

FIGURE 1.1 - The initial inspiration: needing aids to search events

FIGURE 1.2 - Benefits of using Technology

for events to be promoted is the elevator where flyers saturate walls.

Currently advancements in technology have introduced new ways to address event planning solutions. Digital calendars in combination with network connectivity, device synchronization, and cloud computing have become an indispensable tool to keep track and schedule events. Social network sites have also contributed to event planning. Websites and services like forums, Facebook, and Twitter allow connectivity of people with similar interest and the mass notification of events with the click of mouse. The digitizing of content has introduced tremendous tools to inform people about events. For example, filters and keyword searches can be used to display only content of a particular interest. Additionally, customizable displays allow users to modify the font size, color, and organizational structure of how they view information in order to make processing easier for them. To help with the memory load, reminders can be programed to remind users of events or programs they have entered. RSVP features allow event planners to know who plans on attending. Artificial Intelligence computing can filter, display, and suggest events of interest to users based on user habits. Finally, modifications, updates, or additions of pictures, video, or audio to better describe an event can be done in at instant at no additional cost. All these features have greatly eased and increased the efficiency of event planning, causing the general public to easily adopt each update. However, considering the residents in a senior housing community, updating features or even the programs themselves are not viable options. Residents do not own a smart phone or computer, have an email/Facebook/Twitter account, and many lack the training and skills to use these tools.

This technological hindrance deprives residents of the advantages technology has to offer and makes the planning and scheduling of events inefficient. For instance, the current method as exemplified by the story above prevents quick changes of updates, interconnectivity with other facilities, and customizable information displays. Unfortunately, incorporating technology is not a simple task because the current technology has not been developed with elders in mind. Therefore, this project focuses on resolving the technology gap with the users by using design as a way to make the technology more accessible to seniors, and explores how technology can increase awareness and attendance of planned events. To comfort the adoption of new technology, the development of a

prototype that uses tangible interaction is considered because it makes technology more familiar and inviting to the residents. The prototype aims to help residents become better informed about the events and gives them a better sense of control. In addition, this incorporation of technology should ease the attendance and planning of events which will increase their social interaction and lead to a better

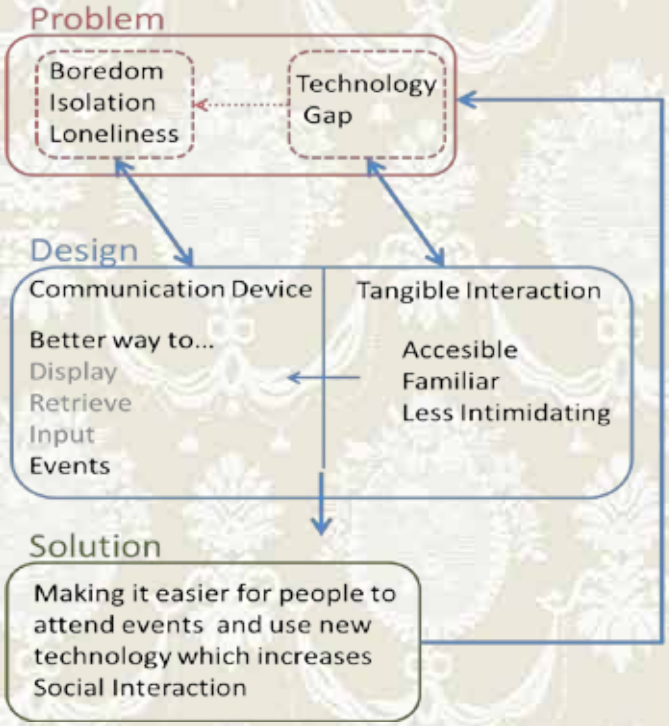


FIGURE 1.3 - Project framework

Methodology

The initial phase of the project will consist of observing and understanding the current method of informing residents about events in assisted living facilities and exploring the various possibilities for improvement. An initial literature review will be conducted to gain knowledge on the end-users (people 65 and older), assisted living facilities, and the types of events the end-users attend. To further understand the situation, on-site interviews and observations will be performed. Three different assisted living facilities will be observed. A minimum of five residents and one event coordinator at each facility will be interviewed once IRB approval is

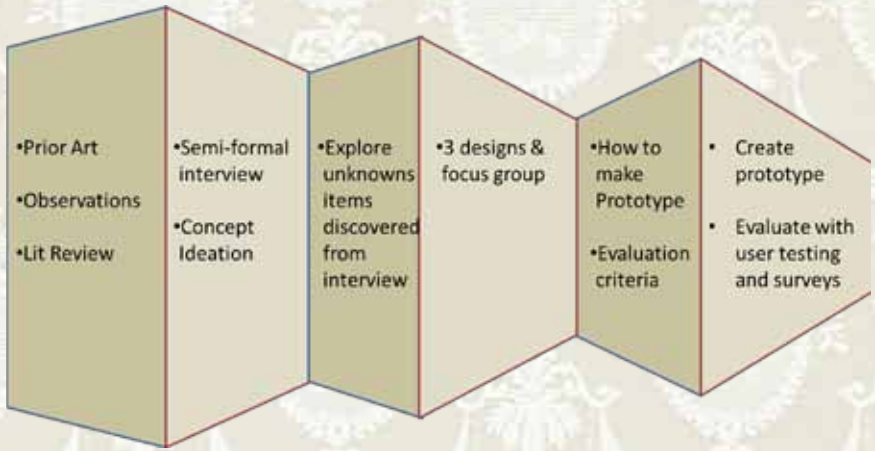


FIGURE 1.4 - Methodology

obtained. The literature review, observations, and interviews will focus on understanding the users' physical and cognitive limitations, the users' needs and desires in regards to events, the constraints placed by the facility regulations, and the needs of the event coordinator. In addition, research on current technologies will be conducted to explore the various options technology can bring to improving event planning. Also, methods and observations on the adoption of new technologies will be researched to account for the technology gap users have.

The second phase will focus on improving the current method of informing residents about events. All the collected data will be synthesized and the information collected will be used to develop three main concepts that address the issue of event planning. These concepts will be presented to a focus group and the collected feedback will be used to narrow the three concepts into a single design. This design will be prototyped as a semi-functional model and will be evaluated by the residents at Calving Court (one of the assisted living facilities used for the interviews).

The final phase will focus on the evaluation of the prototype. A qualitative assessment of the prototype will be conducted. The prototype will be evaluated by distributing a survey to the residents and performing an interview with the event coordinator from Calvin Court. After analyzing the results, the prototype evaluation will be used to conclude whether technology and design did improve the method of informing residents of events.

2

RESEARCH

THE ELDERLY

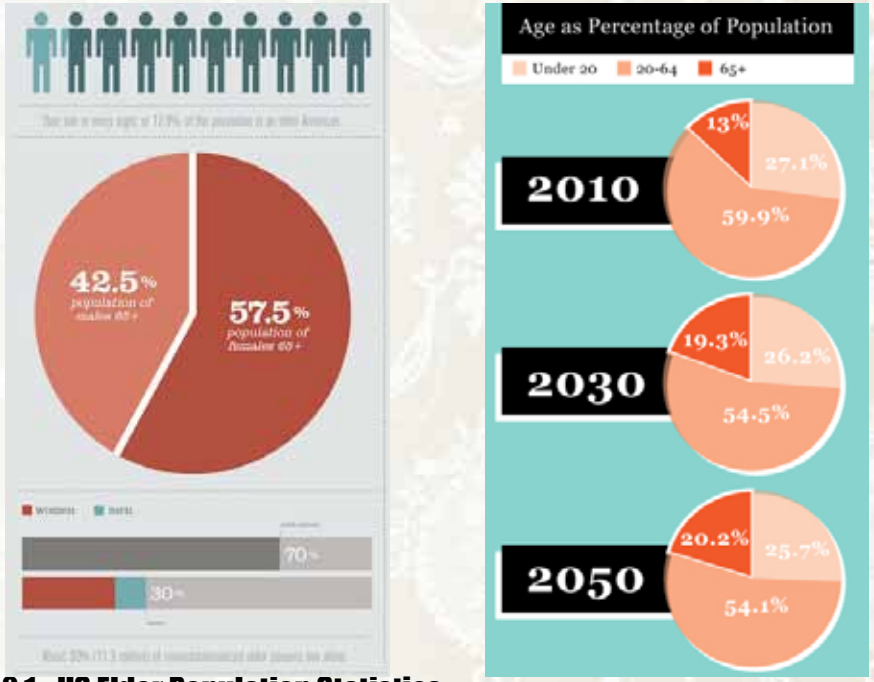


FIGURE 2.1 - US Elder Population Statistics

With aging, people accumulate a vast amount of knowledge and follow personal habits based on their past experiences. The group of people they interact with changes over time. Their expectations, needs, and future goals also change. Finally, the human body is not immune to the passing of time, so physical and cognitive abilities start to decrease. The decrease in these two abilities seriously hinders tasks in which the elderly try to participate in. All of these changes affect the way people view the elderly and how the world interacts with them making designers' understanding of all physical, cognitive, and environmental changes that the elderly community goes through critical.

For the purpose of this study seniors or the elderly community are considered as people 65 and older. This is consistent with how the US census divides the age groups as well as several other services that require defining an age to define a status of a senior citizen. As of 2008 this age group accounted for 13 percent of the total US population, which totals to approximately 38.9 million people. This percentage is expected to increase and reach 20 percent by the year 2050, roughly 88.5 million. Also, by 2050, it is predicted that the world's people population aged 65 and over will reach 520 million.

Out of those 38.9 million people, 73% have a high school diploma and 19% have earned a bachelors or higher education. Also, the ratio of men to women changes for this age group and women substantially outnumber men. As the age line gets pushed to 85, women outnumber men by two.

This demographic group also has some predictable, physical and cognitive changes that are important to consider. Unfortunately, it is difficult to predict what type of physical or cognitive condition an individual or specific group might have or at what age these deficiencies start to occur. This uncertainty complicates things and requires a lot of flexibility to properly accommodate the majority of users in this group. To address this issue the practice of universal design influences this project. To better understand

some of the limitations users might encounter a thorough overview of the main illnesses and disabilities seniors might experience will take place. Presented below is a list of some of common illnesses users might have.

Arthritis
Rheumatoid arthritis
Osteoporosis
Parkinson's disease
Respiratory conditions
Pneumonia
Paralysis
Eye problems
Ear problems
Cardiovascular disease
Anemia
Cancer
Alzheimer's disease
Diabetes osteoarthritis
Stroke
Depression

The side effect of these illnesses along with the natural deterioration of the body due to age can be grouped into five categories: Vision, Hearing, Cognition, Touch, Speech, and Body. Each of these categories has a new set of difficulties that need to be considered when designing products for seniors. A description of these conditions along with photographic support is compiled to have a better understanding of these conditions.

FIGURE 2.2 - Areas affected by Age

Vision

"Blue blindness"
Ability to focus on edges declines
Sensitivity to glare
Lens begin to yellow
More fatigue from light colors (e.g. LCD screen images)
After 70 all require vision aid
Eye adapts to light changes 3 times slower (difficulty adjusting to dark rooms)
Difficulty focusing
Double vision
Tearing of eyes
Sudden loss of vision
Blurred vision
Seeing white or black spots
Seeing a halo around light

FIGURE 2.3 - Technology to help vision

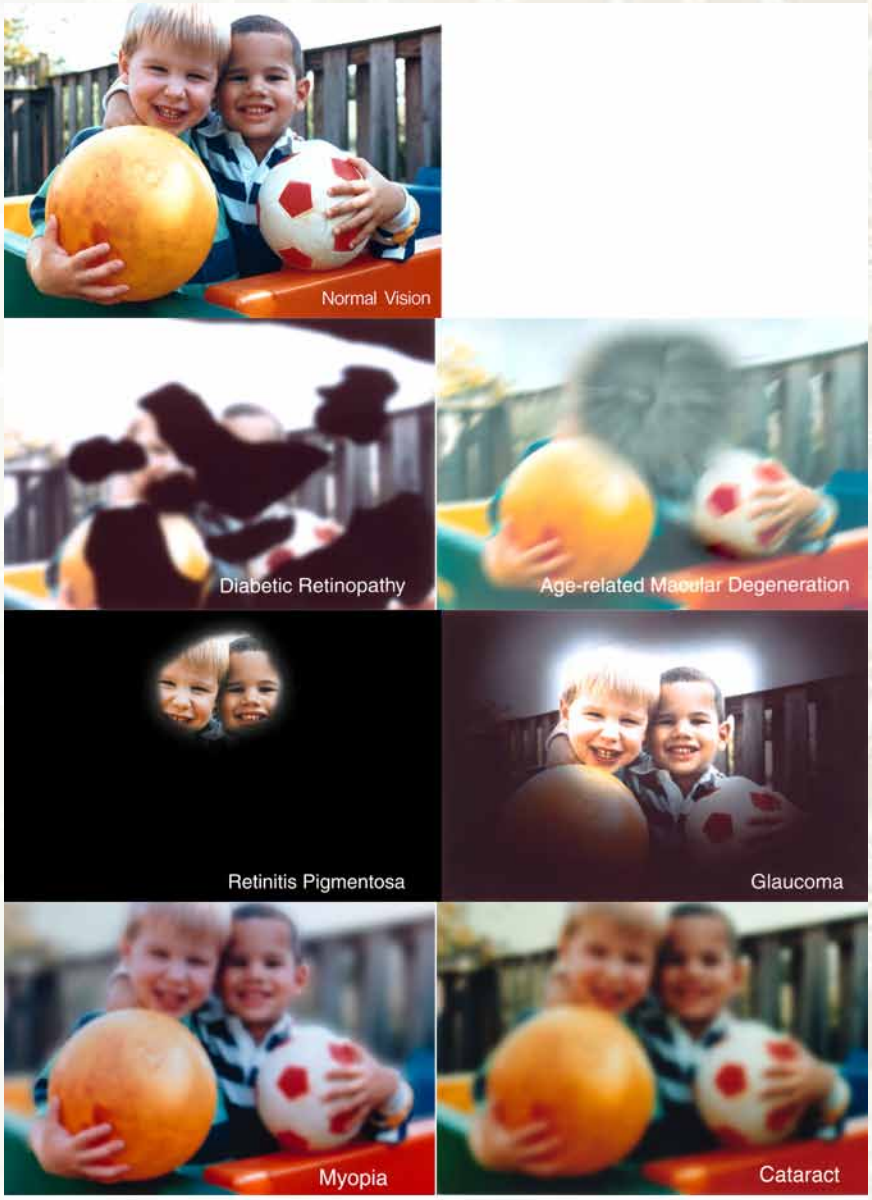


FIGURE 2.4 - visual disability simulation


Body

Tremors
Chronic back pain
Fatigue
Out of breath
Need walking aids
Loss of strength (muscle mass drops ~40%)
Paralysis
Hard to bend over
Stiff/Painful joints



Touch

Reduced sensitivity to cutaneous stimuli (e.g. texture, vibration)
Skin loses elasticity
Skin is more fragile



FIGURE 2.5 - Technology to help a weak body

Hearing

Hearing loss affects quality of speech
Presbycusis (loss of selected frequencies, high frequencies in particular)
Amplitude loss
Harder to focus on conversation because background invitation
Tinnitus noise (i.e. constant background ringing)

Speech

Longer to vocalize
Vocal cords become less elastic and larynx muscles weaken.
Trouble swallowing
Sound Quality drops (e.g. hoarse, muffles, unclear)
Decreased word finding
“Generation” dialect/ taboo subject break

FIGURE 2.6 - Technology to hearing and speech

FIGURE 2.7 - Things that affect Communication

Cognition

Memory loss
Decrease in speed in performing mental operations
Transfer from short term to long term (e.g. learning things)
Attention management: searching, focusing, selective, divided.

FIGURE 2.8 - Technology to help a weak body

FIGURE 2.9 - Mental health difficulties

Elderly Products

Many disabilities can make simple daily tasks almost impossible. For example, the simple act of getting out of a sofa can become extremely strenuous. To address these difficulties many products especially designed to resolve these problems can be found. Tools that provide support, increase grip, and lever strength are some of the many tools available to make daily tasks easier. Design cues from these products can be used to make products for seniors more accessible. Some of the observations taken from these products are:

Use of high contrast and bright colors to easily see the product
Large grips and handles to make it easier to hold
Extensions on products to provide extended reach
Auxiliary structures to provide stability and support

FIGURE 2.10 - products for the elderly

EVENTS

Despite their disabilities and limitations, senior citizens engage in various events. These social activities are crucial to their wellbeing. Events gatherings prevent boredom and isolation which can lead to larger problems like depression. They provide great opportunities to meet new friends who are going through similar situations and who can provide support during hardships of illness and loss. In addition events provide physical conditioning and mental activity that support a healthy wellbeing.

To better understand the activities seniors attend, calendars from various senior housing facilities were analyzed. One of the first observations was the reoccurrence of events which created a weekly routine that was easy to remember. Also, activities that required focused attention or class supported by staff usually didn't last more than an hour. Finally, most events appear to occur in retirement facility grounds. The few activities that occurred outside the premise could be divided into three categories: shopping trips, eating out at restaurants, and an occasional special event like a symphony concert. The facility provides transportation to the outside events which limits the amount of attendees and introduces an additional step of coordinating the ride to the event. Religious and spiritual activities also took up a good portion in

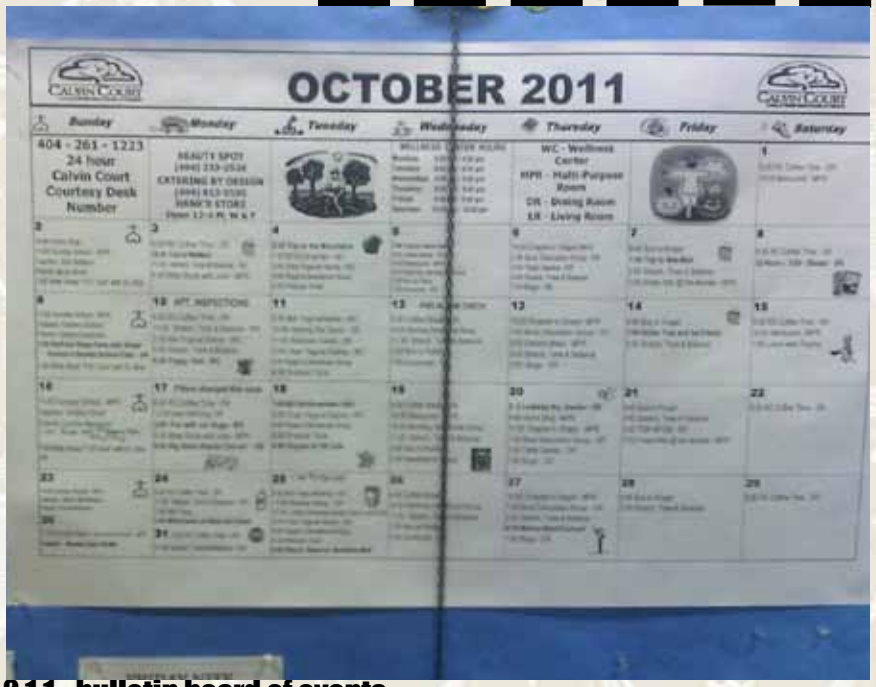


FIGURE 2.11 - bulletin board of events

the calendars and appeared as weekly routine event in many calendars. Overall, most of the activities presented in the calendars were simple activities that provided basic entertainment, physical fitness, spiritual guidance, or shopping escapades.

To further understand the types of events, a photo-ethnography was conducted. The collection of pictures illustrated details about the events that word descriptions in the calendars could not accomplish. Dance events and performances were not fancy. No outrageous outfits or elegant venues were required. In other words, the elderly community only required a school cafeteria with some speakers to dance the night away. Physical activities don't appear too intense. Many of the exercise events collected in the

pictures were of exercises that could be done in a chair, in a park, or in a large room without the need of expensive equipment. Game nights consisted of games like dominoes, bingo, and cards which are games that accommodate for various skill levels both in dexterity and cognition. Some hobby oriented events were also captured like knitting, painting, and singing. The photo-ethnography leads to the conclusion that seniors primarily attended the events, engaged in the activities at their own pace, and the activities chosen allowed for any skill level.

Handling events

Retirement homes rely heavily on monthly calendars, as it is the easiest way to ensure that every resident can see a full picture of events that happen each month. The majority of retirement home websites had their events calendar publicly available online. They show a lot of similarity in the types and formats of events. The calendars collected were overloaded with events and provided no method to filter out the content such as color coding or dividing events into categories. Also, there was limited space for each day limiting the amount of activities that can be advertised on certain day. Acronyms were sometimes used to compensate for space. Flyers and slide shows on TVs were two of the other methods found to advertise events. These methods showed more details about the event and used clip art and color help call attention. These provide better awareness of the events but require more time, knowledge of certain technology, and materials.

FIGURE 2.1 2- Collage of activities

LOCATION

Senior Housing

There is a plethora of living arrangements for senior citizens. The amount of options can become overwhelming but at the same time the vast amount of variability guarantees the availability of a living solution that fits any senior's specific needs. On the broad scope of options, the living arrangements can be classified into three main categories: independent living, assisted living, and nursing home. The dividing factor is focused on the amount of care provided for the activities of daily living and medical care. Independent living provides the greatest amount of freedom. It expects seniors to manage their own life. They are responsible for their personal grooming, up-keeping of their space, transportation and health care. However it differs from other living solutions by providing a simpler living space, better location, or lower cost. For example, the up keep of a house can become cumbersome and expensive so moving to smaller space closer to family and friends can be better. Also, moving to places like a retirement community can help introduce people to new friends and activities. Some residents have club facilities and event calendar that help people bring people together. Once physical and mental problems arise assistance with activities of daily living might be required. Also, the comfort of having a support network readily available in case of an emergency is important to

FIGURE 2.13 - Independent Living

FIGURE 2.14- Assisted Living

FIGURE 2.15- Nursing Home

those with continued health problems. Assisted living is the solution for these types of situations. Assisted living facilities can provide services like transportation, linens, meal plans, housekeeping, medical support, and event coordination. Yet, they are focused on providing the greatest level of independence possible. Many residents can have a living situation equal to that of independent living where they have their own room and schedule which they manage independently. The biggest advantage of this option is that, if something does happen, the support is available. Also, when the assistance becomes vital, the transition is easy since residents have been acclimated to the location.

Finally when health issues become more serious and a greater amount of support is required to do the activities of daily living, nursing homes are an option to consider. These could be a temporal stay where someone is recovering from a heart attack or stroke, or it could be a permanent move after it has been deemed that a substantial level of support and care is required. Additional support in the daily tasks is expanded to provide help getting out of bed, bathing, and medication administration. Also more attention and more careful check-up of residents is provided. This intense care requires a specialized staff requiring facilities of this caliber have trained nurses, physical therapists, and doctors available 24 hours a day. These facilities still try to provide the greatest level of independence and dignity for their residents. The notion that sending a loved one to a nursing should not be seen as an act of not caring, but rather as the best option for providing proper care for a loved one. The locations can also serve as a temporary housing situation for those that are recovering from heart attacks or strokes and in search of extra care.

Calvin Court

Calvin Court is an independent living facility and part of the Presbyterian Homes of Georgia. Presbyterian Homes of Georgia is a Christian ministry serving people without regard to race, gender, religion, national origin, color, creed, or handicap status. Residents at Calvin Court must be 62 or older and be able to independently conduct the activities of daily living (ADL's). The five common categories of activities are eating, which includes cooking and serving food; dressing; bathing, which includes getting in and out of a tub or shower; personal grooming; and home management, which includes housework, shopping, and laundry .

The facility includes 241 apartments in an 11 story

building. The apartments can vary from a studio to a large one bedroom apartment. Each floor has its own common areas, and based on the residents each floor acquires a personality of its own (e.g. the floor that likes to decorate for the holidays). Although no nursing staff is available, the facility provides 24-hour medical assistance. For entertainment and convenience the place also offers the following services:

Barber & beauty shop
Common areas
Dining rooms
Fitness center
Library
Religious facility
Safety and security systems
Emergency call systems

In addition to the facilities, Calvin Court can also **provide**
Housekeeping
Laundry and linen services
Meal plans
Limited transportation

FIGURE 2.16- Calvin Court senior housing facility

FIGURE 2.17- Calving Court single bedroom

TECHNOLOGY

ubicom & evolution

Technology evolves at an exponential rate introducing new tools and benefits that improve our everyday life. This expansion has grown so much that products with embedded technology surround our everyday life and are slowly acting behind the scenes making it is possible to focus on the task at hand rather than on technology behind it. Among the various areas where this concept of ubiquitous technology has been seen is in the availability of tools to help event gatherings. The tools can be divided into two main categories: software and hardware. Then each of these categories can fall anywhere in between private or public level of reach.

FIGURE 2.18- Examples of ubiquitous technology

Technology

One of the most abundant software tools to help planning is the digital calendar. A look at popular calendars like Google Calendar and Outlook show incredible functionality. The tools available are overwhelming and to people with limited computer experience the amount of functionality can become intimidating. Another popular software tool are websites that show events that are happening in the city. The filtering tools are very useful and it is something to consider for this project. However, these websites are not designed with seniors in mind. Some of the challenges seniors my encounter include the need to constantly update and maintain the website, the need to filter through the ads and extra content, and the type of events that get posted. Finally, tools like Facebook are very convenient and empower people to create their own events. However, for events invites to work, the people that are invited have to be part of the network and when looking at senior citizens that is not likely to be the case.
The difficulties expand past software. Hardware also contributes to seniors not using technology to help event planning. The vast amount of products available prevents consistency which makes it harder to teach and learn about devices. Although many devices, have accessibility tools people don't use them therefore the devices are strenuous to use to seniors.

Finally, the lack of familiarity with a product makes it hard to understand functionality. For instance, being used to thinking of cameras as a box that uses film prevents the idea of using a phone as a camera because a phone does not meet the form requirements expected of a camera.
With all these hindrances, a technological device for seniors would be a great asset. However, making seamless, intuitive interactions requires careful design. Design uses conventions, affordances, familiarity, and multi-modal operations to provide a flexible system that easy to use. Therefore these things need to be properly considered to address the needs of the elderly.

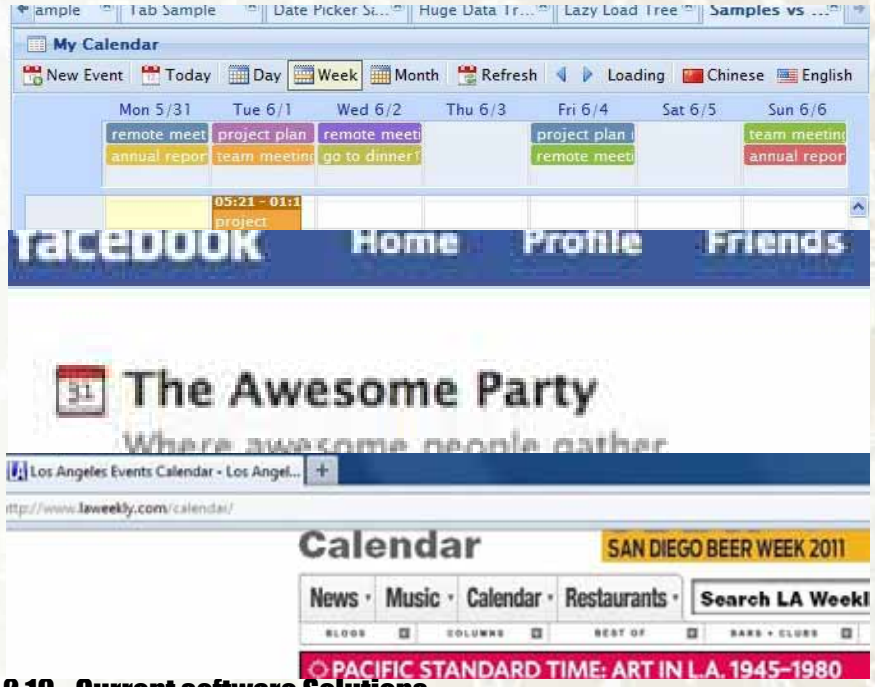


FIGURE 2.19 - Current software Solutions

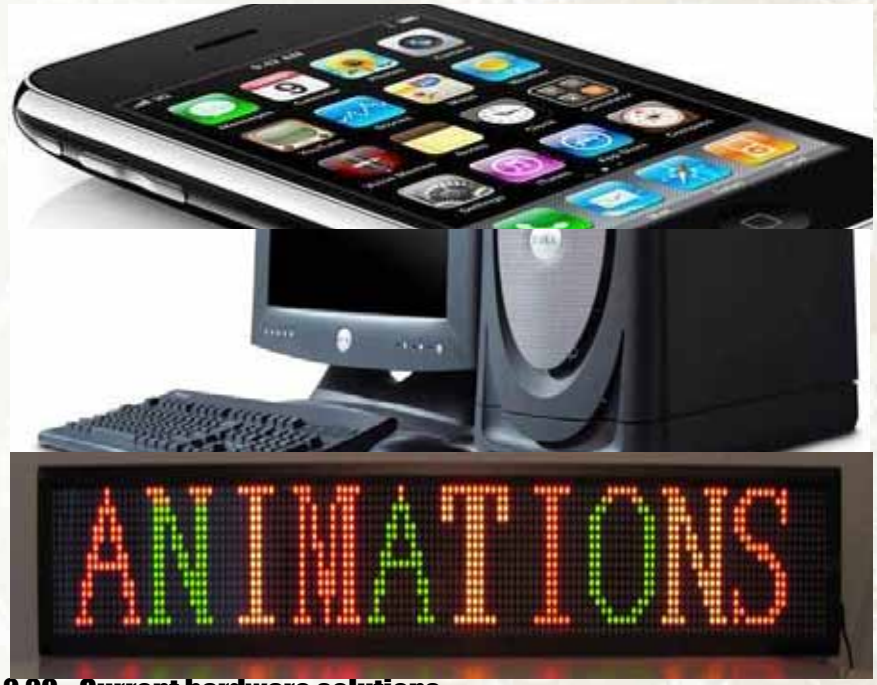


FIGURE 2.20 - Current hardware solutions

Low-tech

Below are some of the advantages of low tech

Cost
Simplicity
Easy to implement

FIGURE 2.21 - A roaming robot without navigation algorithms

Tangible tech

Below are some of the advantages of tangible technology

Familiar
Accessible
Provides affordances

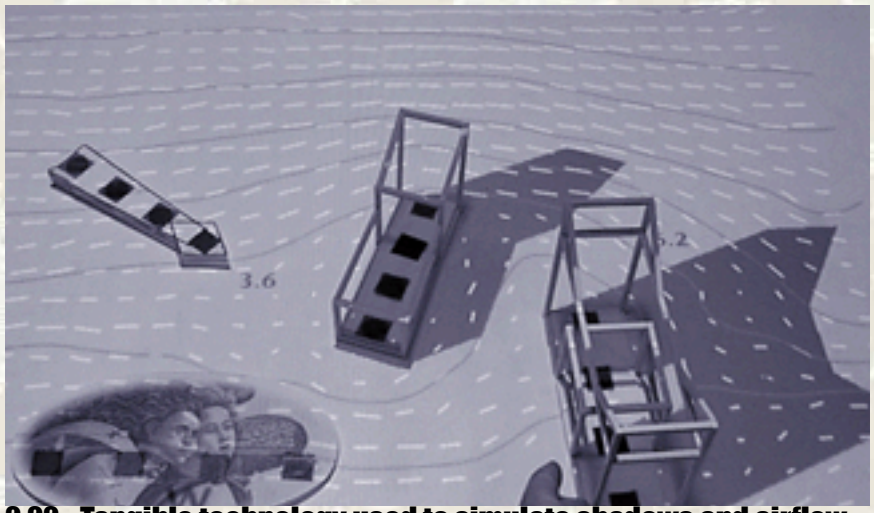


FIGURE 2.22 - Tangible technology used to simulate shadows and airflow

OBSERVATIONS

In order to better understand the users, types of events, and environments I started to regularly attend events coordinated by Calvin Court for a period of 6 months. This involvement allowed me to experience the different types of the events ranging from the routine activities to the more special events that occur every month or two. I started by getting involved in their book club. The selection of books and their view topics started to paint a better picture of the users. The attraction to

FIGURE 2.23 - Sketch used to record observations

FIGURE 2.24 - sample of observations

historical books and stories from their past reminded me that most of residents at Calvin Court were born when the television didn't exist. The residents did not experience the same technological device abundance as I so it is important to try and see things from their experience. For instance, a typewriter is more familiar than a computer keyboard. Another observation was the need to use a microphone during the sessions to accommodate the hard of hearing. This slowed the flow of conversation and sometimes prevents people from sharing their thoughts because they did not want to deal with having to get or use the microphone. As I continued to get involved with the book club I was able to experience the fragility of the residents. One of the members was critically ill and stopped attending because she was hospitalized. Sometimes residents had to catch their breath while making a small comment because of respiratory problems. Also, people with walkers and canes always moved at a slow pace as a result of their moving disability. These conditions meant waiting for everyone to settle down took longer than usual. Despite it all, the book club generally gave a positive vibe and was very welcoming. It was easy to attend a meeting and just sit and listen. Most attendees took a passive role and were mostly listeners. It was up to the event organizer (in this case a staff member from Calvin Court) to keep the conversation flowing. The book club was the event I got most involved with. I even had the opportunity to lead the group as I substituted for the event organizer for two sessions. This gave me the experience from the planning side of an event. During my time heading the book club, the regular location was in conflict with another event that used the same room so we had to meet in a different location. However, there was no way to inform the residents so a note that redirected to the new location was posted in the original meeting place. Also, prior to meeting, the room had to be rearranged and I had to get the microphone set-up. Although these were small details, these show some of the consequence of a lot of the events happening in the same location, use of tools to accommodate for disabilities, and lack of ability to make last minute changes to an event.

Aside from the book club I also attended other events with a more a casual approach. Their game nights consisted of dominoes and card games and anybody could jump in a game. For the games, there was no intense competition or strategy it was just plain fun. Their coffee breaks, a morning event where free coffee and snacks were served, is an event to just socialize and hear the stories residents wanted to

share. Although, conversations amongst residents were slightly different and could be seen as a regular conversation between friends rather than sharing stories of the past as was the case when they talked to me. Also, a good amount people just went to coffee breaks to people watch. They didn't partake in any conversation and were just there to be in the company of people. Movie nights provided some easy entertainment and free ice cream. Not much social interaction occurred at this event; people just saw the movie and left. To experience events that occurred outside of Calvin Court I joined in one of their trips to the Dollar Tree. It was an hour drive in a 14 seat bus driven by the event coordinator herself. As I talked to the residents they mentioned how limited seating made it a hassle because the needed to reserve seats; people were waiting in line to reserve a seat the minute the event was posted. I also attended less routine events. There was a puppy night were they brought puppies for the residents to pet. It was interesting to see the contrast in energy between the puppies and the residents. The puppies were running all over the place as the residents simply watched and smiled as the puppies played. Calvin Court also had live performances. As spectators, residents enjoyed the performances and even sung along, but, as was previously mentioned, there were people that were there just to be around with other people and showed a more passive involvement in the event. Calvin Court also has an annual event to remember and say a final good-bye to some of the people that lived there. Friends and family are all welcomed to come. It was a very touching ceremony and reflects the caring bonds amongst residents. It also reminds me how residents are in their late stages in life where dealing with the death of friends is not uncommon. Many residents are making amends with their lives and seeing things in a day-by-day basis. For instance, when I was talking to a resident I remember her saying "today is a great day because I woke up this morning".

My continual involvement with Calvin Court allowed me to know residents better and with some residents I even became friends. I was invited to get coffee, sing karaoke, and partake in think tank sessions were residents get together to share their views on different issues. This experienced showed me a new view on events where attendees were more engaged and they know each other better. Conversations were livelier and the notion of having an event organizer disappeared since everyone was contributing to the event. Of course, none these events were advertised. These events which occurred often and routinely

FIGURE 2.25 - Puppy visits

FIGURE 2.26 - Trip to the Dollar Store

FIGURE 2.27 - Karaoke at Mckinnon's Restaurant

FIGURE 2.28 - Book Club

were all by personal invite where someone invited you in person.

In trying to attend events I had a better understanding of how events were handled at Calvin court. I was downloading their newsletter and calendar which residents receive in paper form every month. I also had to look at their bulletin board and posted flyers to see if there is an event I would want to attend that I might have missed. The posted stuff was great for last minute decisions were I had extra time and wanted to see what I could do. The fact that most of the activities occurred inside the building was great because it was so convenient. There was no need to drive anywhere and for the people that live there it is just an elevator ride away which is great in case they forget stuff in their room. Calvin Court also has dedicated TV channel to advertise events however the information posted is outdated and doesn't cycle fast enough so residents rarely watch it. A loud speaker system in each floor is sometimes used to remind residents of events that are occurring but unless apartment doors are open people can't hear the message. In the end, the most reliable and convenient way to know of the events was the bulletin board. However, after a while, I knew which events I enjoyed the most and since they were mostly routine events I wasn't relying on the calendar that much. I stop paying attention to the calendar and suddenly getting personally invited/reminded of events became my main source of information for knowing what events were occurring.

My involvement in Calvin Court taught me a lot about the residents, events, and how they get coordinated. Below is a list summarizing some of my observations:

Attendees are mostly residents
Average group size for routine events 12
Bigger less routine events 20
TV channel and Loudspeaker system
Two types of residents

INTERVIEWS

To better understand a more personal view of how events and technology get handled by residents I conducted 10 one-on-one interviews with residents and staff. Four subjects were staff including the event coordinator and the remaining six were residents. The residents were all older than 70 and lived at Calvin court for periods longer than 3 years. The interviews focused mostly on how residents handled events. It tried to evaluate the events residents attended and how they became informed about them. It explored how the subjects sorted the information and selected the events they wanted to attend. Finally the interview discussed ways to improve the system by keeping key elements that the residents and staff liked and improving or removing elements they did not like.

With everybody that I interviewed the key to scheduling their day was the monthly calendar. Most residents adopted the calendar as their own and added events such as personal doctor's visits, when they were expecting visitors, and events that were not originally on the calendar. This personal calendar had the advantage over the bulletin board that residents and staff could place it where they would be able to easily access it daily. People put the calendar on the door to exit of their apartment, on the fridge, and even in the closet. Based on their responses 8 out of the 10 people were highly involved with the events coordinated by Calvin Court. This includes both residents and staff. Staff would mostly focus on the many activities they were responsible for coordinating during the week. However, on occasion they would attend other functions to support other staff members and be with the residents. Meanwhile, residents that were highly involved with the activities at Calvin Court had created a routine steered by the events scheduled. For the two people that were not interested in the Calvin court activities their reasoning was because they didn't enjoy the people that attend the events and they didn't like the event in general. As a third reason, one of the subjects mentioned that his hearing disability and constant need to use a restroom made it uncomfortable to attend the events.

In terms of sorting information and events, there is not much change between months so the predictability helps sort the information. Everybody had a general idea of the type of activities offered by Calvin Court. All residents do a careful scan of the events programmed the first time they receive their monthly calendar. Based on their individual routine they already have an idea of the events they

want to attend but they still do a quick scan of the new calendar to verify and see if new events are happening. After the initial scan of the calendar, some highlight, add notes, or just throw it away. For the residents that attend most of the events extra activities like doctor appointments get scheduled around the events while the other group has their own schedule and fit the Calvin Court activities of interest into their independent schedule. When discussing what residents do to remind themselves

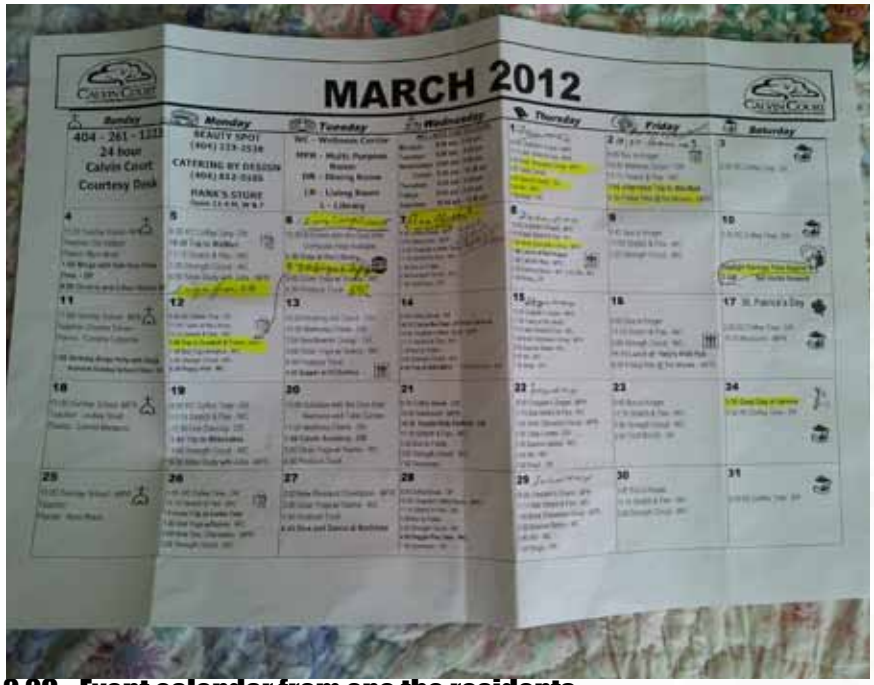


FIGURE 2.29 - Event calendar from one the residents

of events everybody had a different answer: Some people said they never look and know what they want to attend, others look at the calendar constantly since it is in plain view in their apartment, and others look at the calendar at night to plan appropriately for the next day. Aside from the calendar residents also mentioned using the bulletin board and flyers to help them remember what events were happening.

Finally, when discussing the overall way events get handled and ways to improve it not too much feedback was given. Most of the people were satisfied with the way things are and couldn't think of any changes. Also there was nothing they particularly liked about the way events get handled which gave the impression that residents were content on leaving the calendar alone. Most people liked the way the event coordinator was doing things and the events that were being offered. However, one of the interviewee disliked how things were handled and complained that the events coordinator had too much in her hands and needs to put more effort into the events. Overall, it appears everyone is complaisant with the system but the having all the events be planned by a single person, the unavailability of tools to help residents advertise their own events, and overload of work the event coordinator partakes in

are things to consider when looking for opportunities to improve the way events get handled.

The second part of the interview discussed how to interact with public use technological devices and how the housing of such a product could make it approachable. To explore the former, three different input options were shown to the interviewees: a touch screen, a keyboard, and a pen/touch screen combo. Out of the three the preferred method of input was the touch screen. To explore the look of the product, 6 different products that used a touch screen were shown. They showed a variation in appearance from a very functional housing to one that exhibited more of a personality having a face and features to show expression. Out of the six most people selected a minimalistic housing that showed some styling.

FIGURE 2.30 - Primary and secondary preference in appear-

FIGURE 2.31 - Primary interface interaction preference

3

DESIGN

IDEATION

After finalizing the literary reviews and prior art search, an ideation period started in parallel with my involvement with Calvin Court. For a period of about month and a half I started sketching a concept idea every day. They ideas ranged from outrageous solutions way outside the scope of my abilities and limitations to very simple solutions that could be tested in a day. This amounted to a bank of ideas with about 50 different solutions. With help of the knowledge gained from my prior art, literary review, observations, and interviews, the 50 ideas were narrowed down to three concepts: the event map, event flower, and write and let it roam. These ideas were refined and illustrated in a concept board which I discussed with peers and residents to help select one single concept.

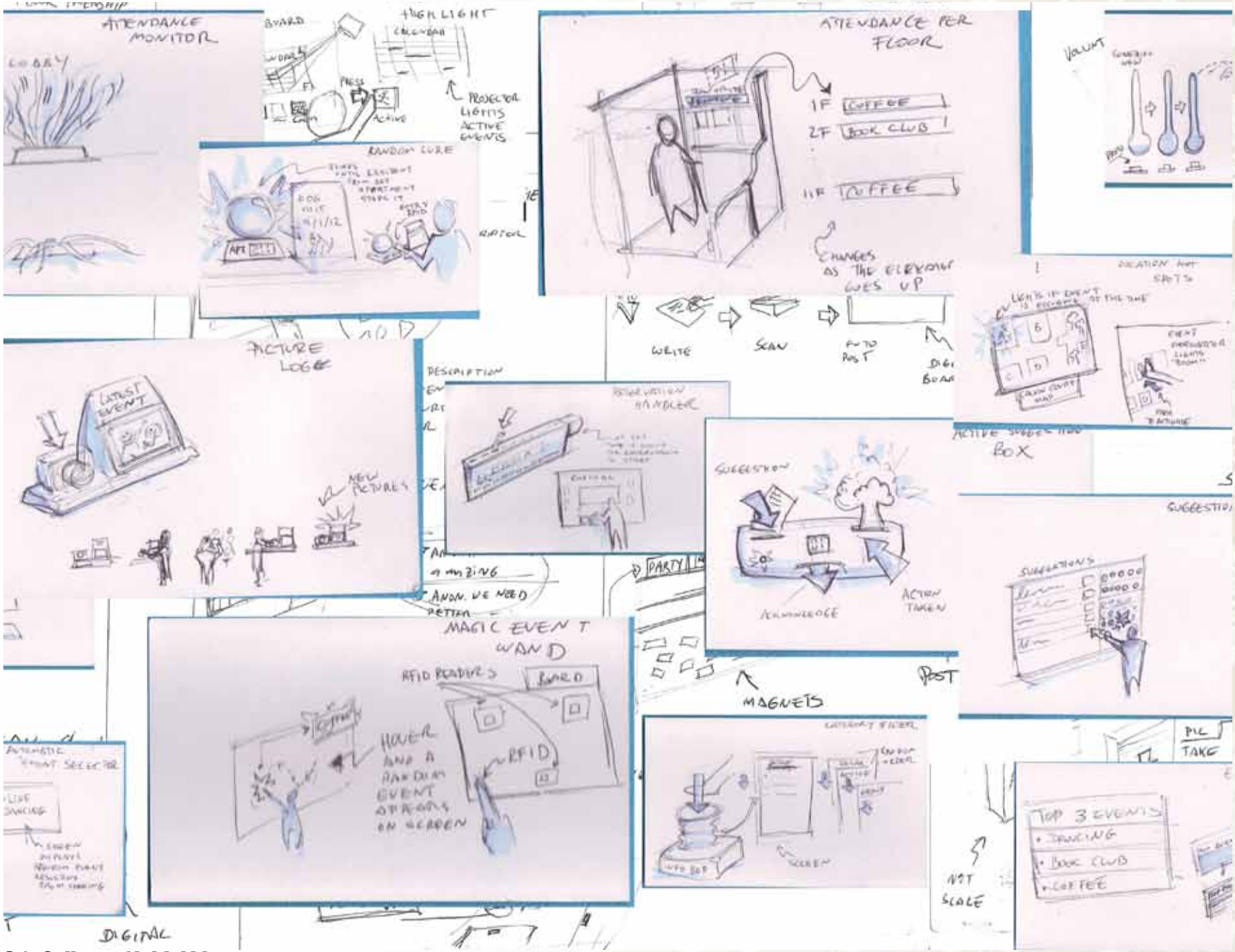
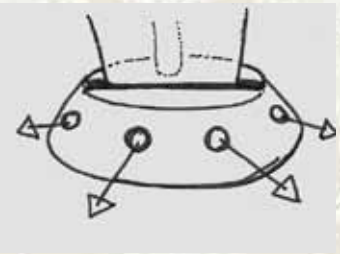


FIGURE 3.1 - Collage of initial Ideas

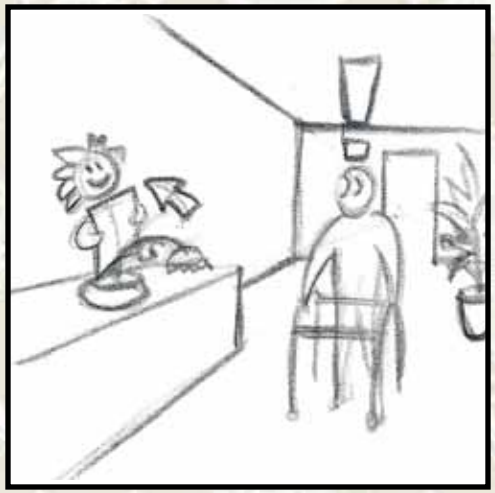
1 EVENT FLOWER

Use motion to attract attention

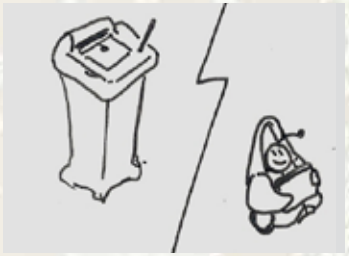
Designed to grasp current paper flyers



Multidirectional sensors



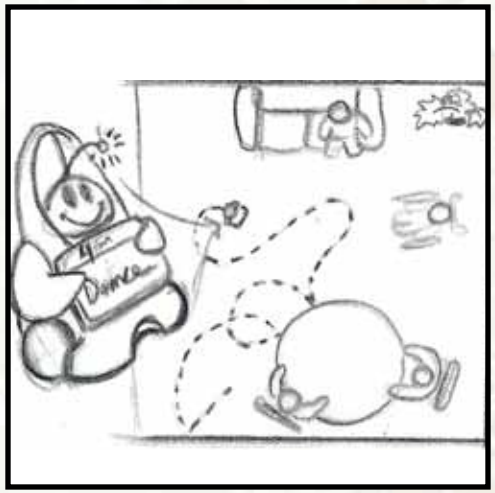
2 WRITE AND LET IT ROAM



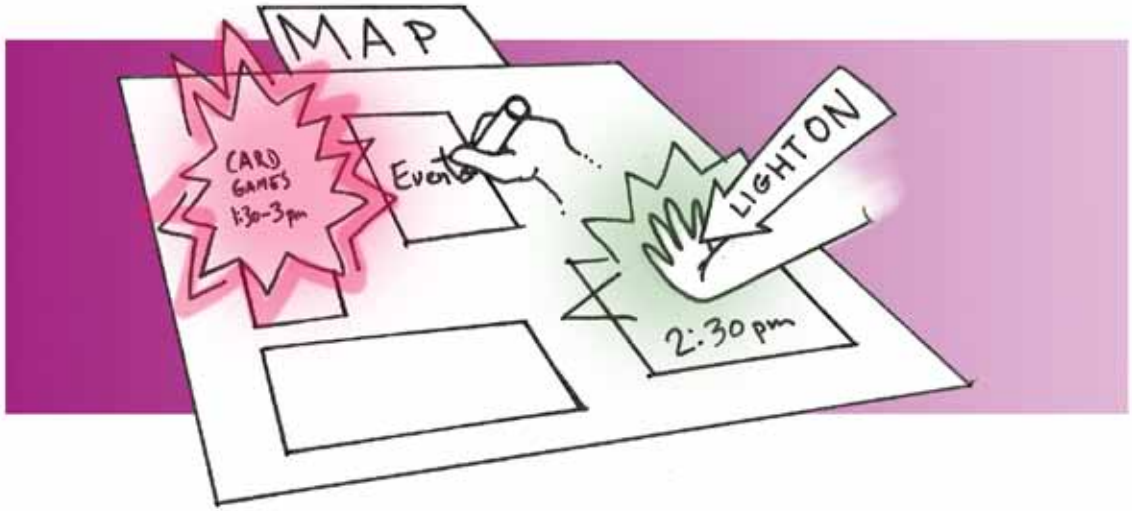
Two Part System

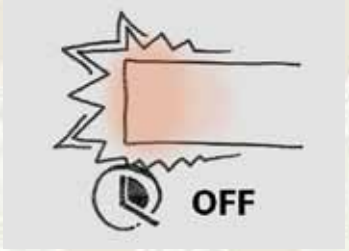
Easy to lift and manoeuvre for better view.

Tangible interface for easy manipulation

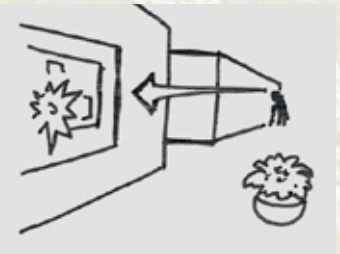


3 EVENT HOTSPOTS



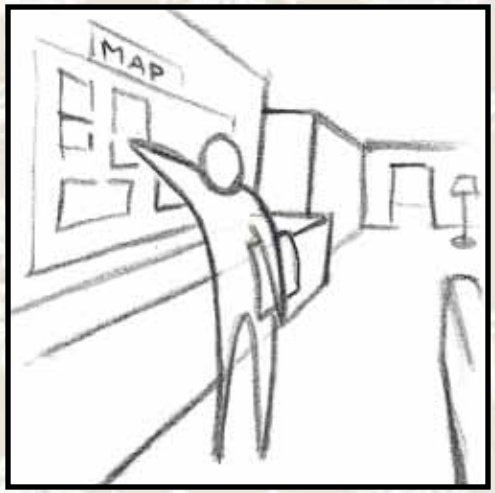


Automatic turn OFF timer



Easy to view from far away

Color coded lights for each location



REFINEMENTS

The final concept was the write and let it roam. The concept is a two part system that empowers residents and gives them the ability to share their knowledge of events that are occurring. The input station (first part of the system) would be in a location of heavy foot traffic allowing residents to stop by and post an event. The output device (second part of the system) is a roaming pet that would randomly circulate in the commons area. The idea is that output device becomes an “information pet” that would use a screen, color, sound, and motion to inform residents of events that are occurring. Unfortunately, properly presenting the concept as it was initially conceived had several complications. Most of problems were with the roaming pet. Some of the complications of the roaming pet were that the pet would be a trip hazard, would need to be secured from theft, and require maintenance like charging the battery. These complications modified the design and changed the output into a stationary monitor. However idea of using light, sound, and movement to help convey information would remain. In addition, to make the adoption of technology easier three main requirements were set: empower residents, make it familiar, and construct a simple design. Based on these new parameters, a new set of sketches to embody the concept were generated. Even though the system consists of two parts, the input system provides the most interaction with the residents and is the source of all information causing the design and technology for the input system to be the primary focus of this project.

FIGURE 3.2 - Selected concept

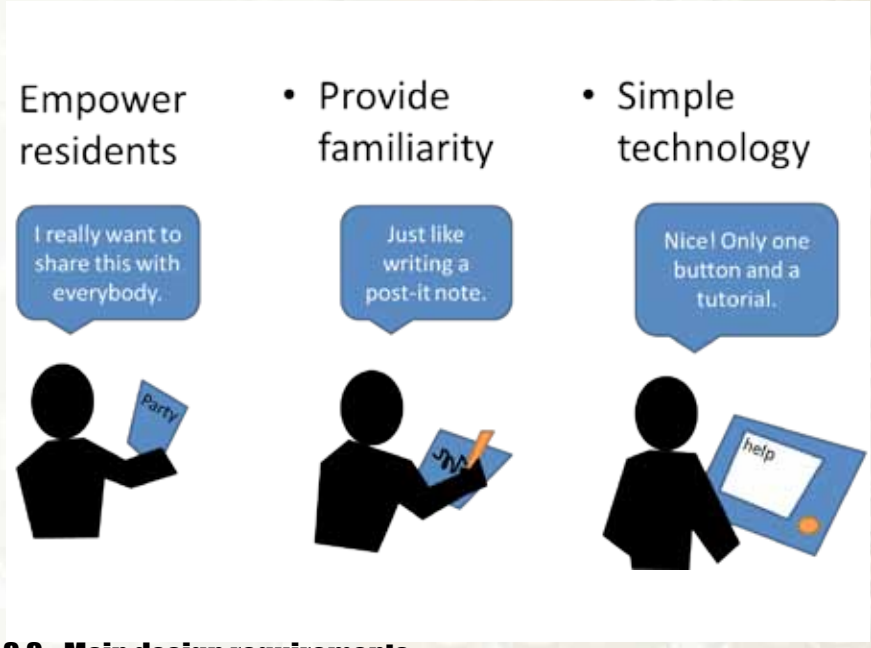


FIGURE 3.3 - Main design requirements

To translate the sketches into a physical concept, details explaining how the system would work had to be defined. The idea behind the input station was a multi-modal operation that allowed users to input information in two main modes. The first mode was a traditional form like writing a letter. The second mode was a more modern approach that used an application through a touch screen. In capturing the information, the data was divided in two main parts: the body and tags. The body was the description

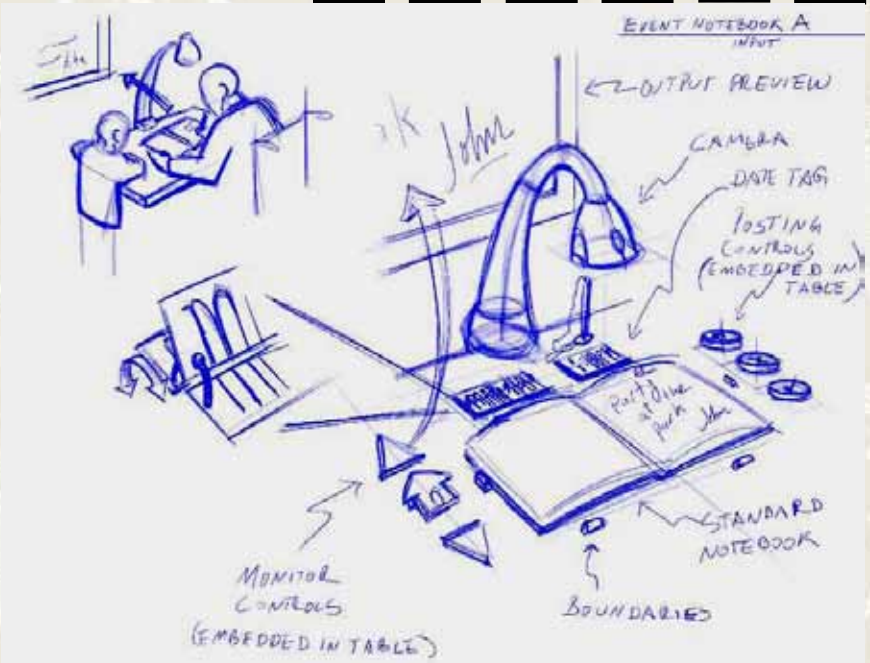


FIGURE 3.5 - Input concept refinement 2: Camera snapshot

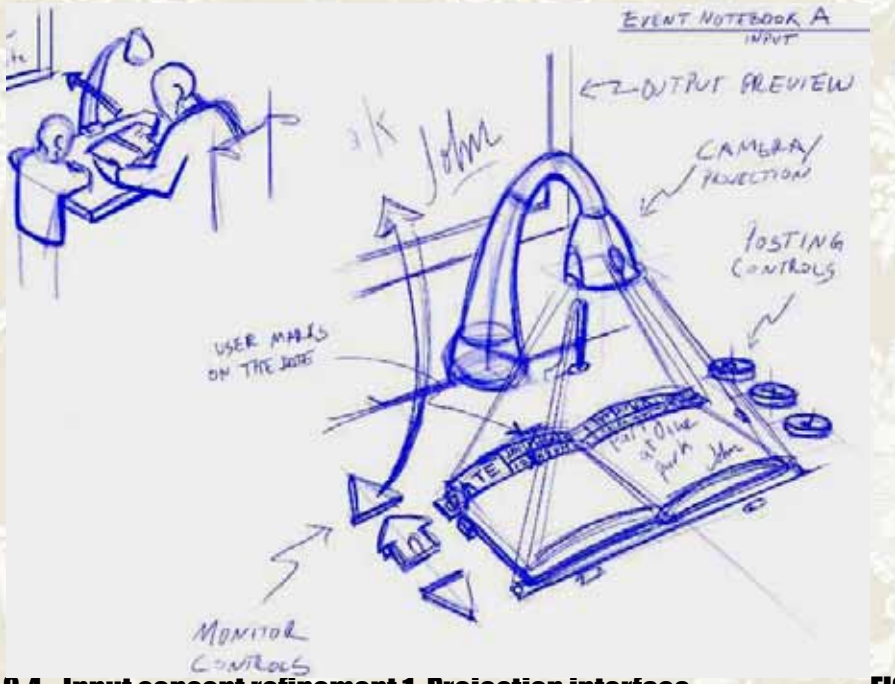


FIGURE 3.4 - Input concept refinement 1: Projection interface

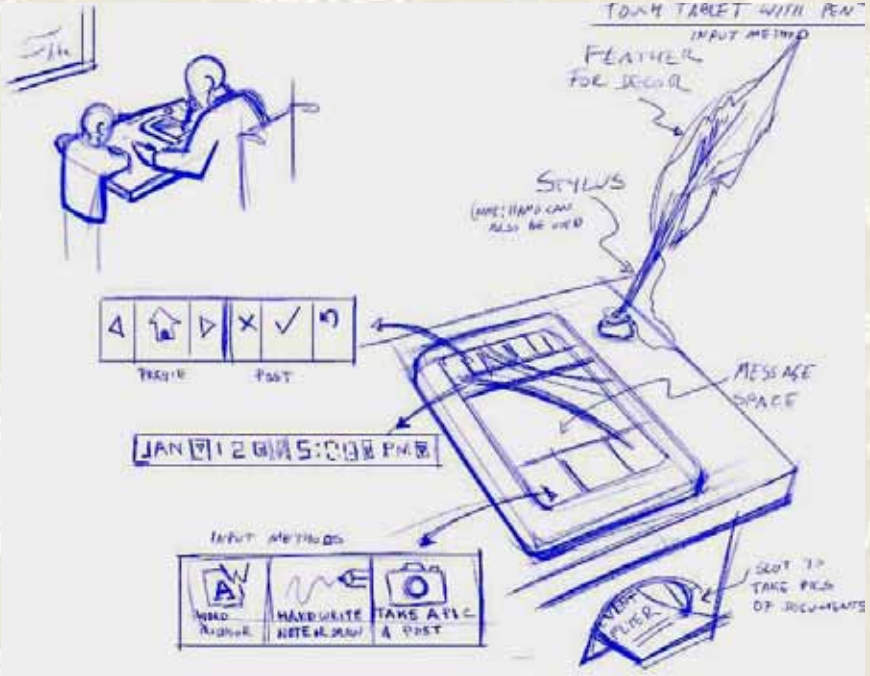


FIGURE 3.6 - Input concept refinement 3: Tablet

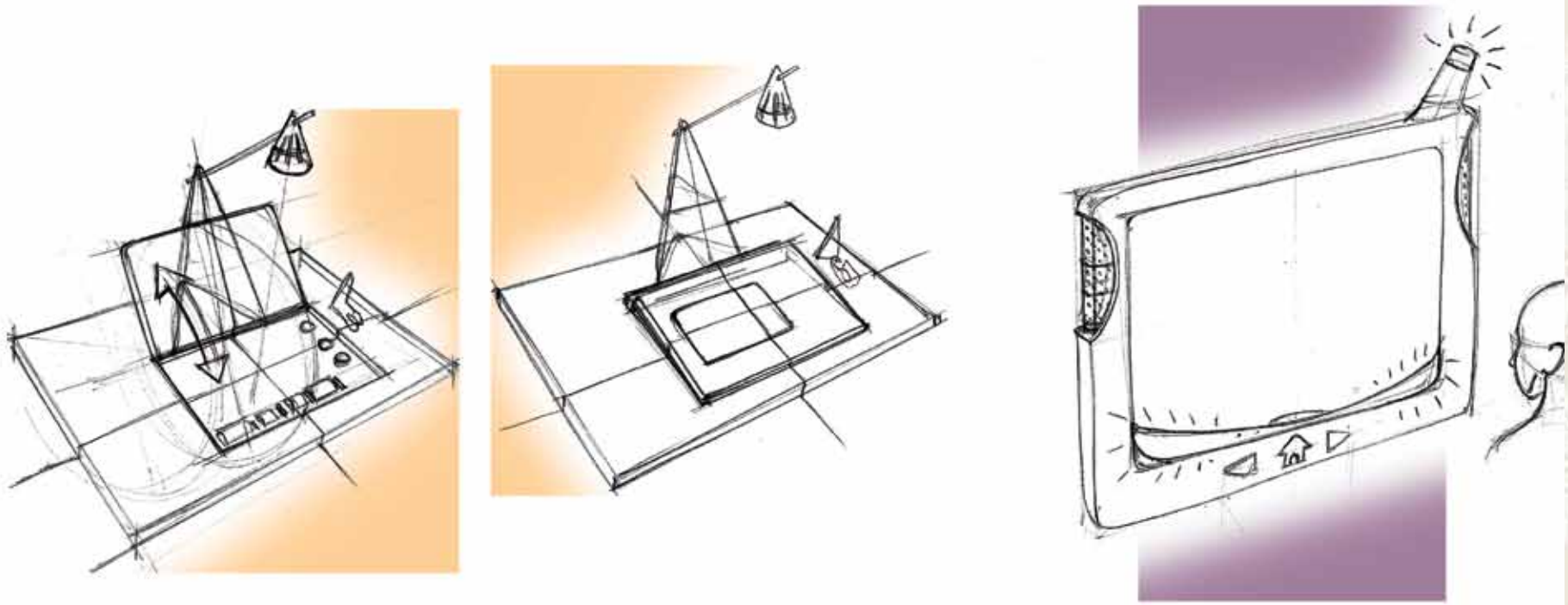


FIGURE 3.7 - Final concept direction

of the event and the tags would be metadata that would be used to categorize and filter the event. For example, for a birthday party, the body would contain a picture or text that would say “John’s birthday party”. When inputting the body information, users should not feel limited or frustrated by the technology. Therefore the input station must provide a method that is familiar and efficient. To address this, idea of taking a picture of the message was implemented. Users could write a message by hand or bring a handmade invitation and capture the pure intent of the event in an instant. It’s analogous to the idea of photocopying a flyer and distributing it everywhere but, instead of using a photocopy, users take a picture. This also has the advantage there is no need for complicated computer algorithms to decipher the information. When a picture is taken the information is displayed as is. Viewers of the displayed event would take the processing workload of understanding the message. To translate this idea to the touch screen application a blank canvas on screen that takes the place of paper and users can write their message using the finger as a pen or summoning a touchscreen keyboard to type the message. All the information located in the canvas area will be captured and displayed as is. However,

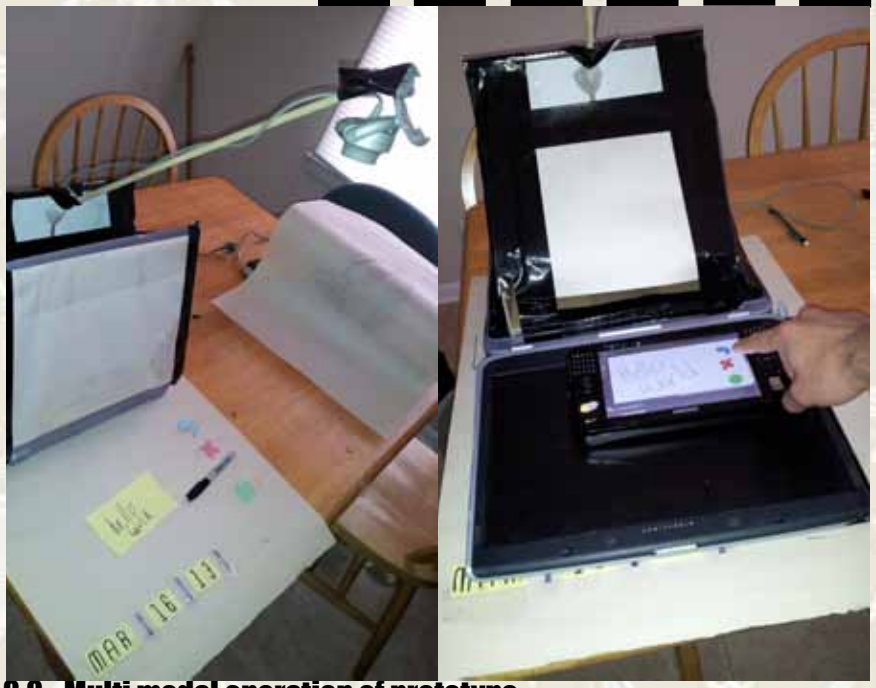


FIGURE 3.8 - Multi modal operation of prototype

FIGURE 3.9 - Using projection to simulate the output display

to filter the posted events tags are required. Tags would be things like date, time, and location. This information lets the system manipulate the data and do things like display events only on the day they happen, or flash light when an event is about to start. Tags like categories can be implemented to color code information or create a search category. So unlike the body, the tags have to be recognizable by the system. This requires a method for users to input these details and still allow the system to recognize the information. Resolving this in a touchscreen application can be done by implementing drop-down menus. This solution is then translated to the traditional mode so design will incorporate the use of a tangible drop down menu. As with digital drop-down menu, a collection of possible selections are stored and, using buttons or rollers, users can cycle through the options until they find the one they like. When the camera takes a picture of the event it also takes a picture of the tangible drop-down menu. Since the tangible drop-down menu options are predictable, the system can analyze the image and recognize the value of the tangible drop-down menu which then would enable the system to generate the digital tag for the posting.

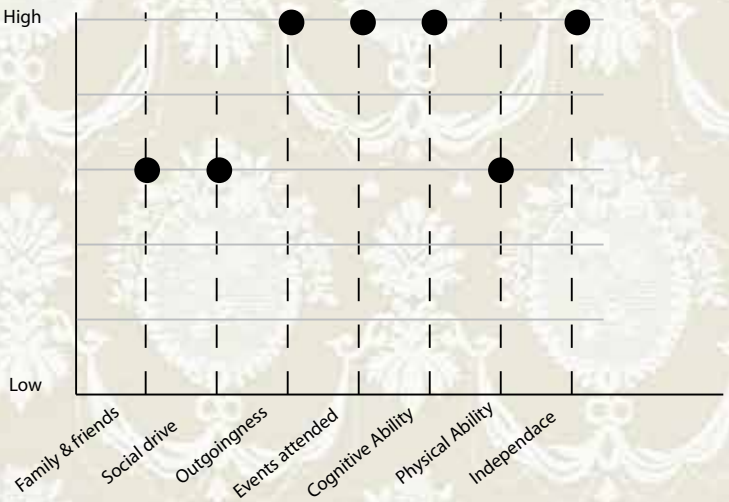
Once the on operation of the concept was defined a physical prototype was built to explore the size, feasibility, and technology. The functional model provided both modes of operation and used a projector to display the event posted. The initial model used some old technology but was enough to confirm the technology would work. However to observe the usability and accessibility of the idea personas were created to simulate scenarios.

PERSONAS

Based on the observations at Calvin Court, six personas that embody some of the main personalities and behaviors residents have were created. These personas were used to run scenarios evaluate ideas.

Marry

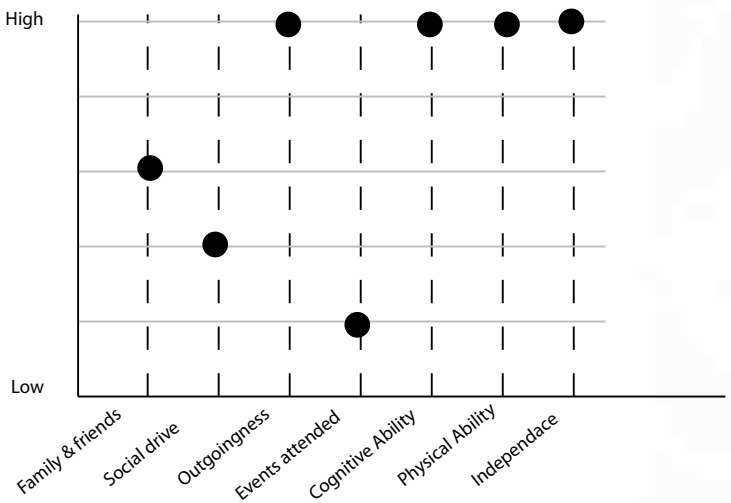
Age: 75
Years at Calvin Court: 5
Limitations: osteoporosis
Hobbies: Writing



Mary is an extremely active person. She regularly involves herself in most of the events Calvin Court has to offer. She actively participates in the events by seeking out ways to become involved in the creation and planning stages as well as volunteering during each event that she attends. Also, she has made Calvin Court her own by decorating her floor, which provides her and her neighbors a sense of community within the facility. Her constant involvement in so many activities keeps her on a tight schedule. Organization is key. She writes in her agenda at every meeting in order to stay on top of all of the events that she wishes to participate in. Her life centers around Calvin court; therefore, she rarely ventures beyond Calvin Court to explore other opportunities or activities. She has a small group of close friends and a fair amount of acquaintances, since she is involved in so many different activities. When she has time to herself, she indulges in the occasional movie playing on TV. However, if nothing is on TV, she enjoys reading. Also, she tries to stay up to date with the current events by going online to read the newspaper.

Julie

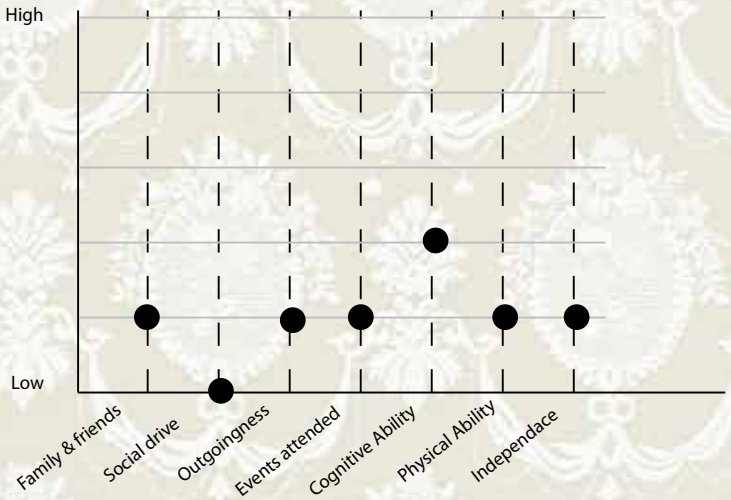
Age: 65
Years at Calvin Court: .5
Limitations: none
Hobbies: Shopping



Julie recently moved to Calvin Court. So far she has enjoyed the people and environment that Calvin Court has to offer her. In order to become a part of the community and determine what activities she enjoys the most she has been attending all types of events. There are two main ways that she becomes interested in the events: a new friend will invite her, or a flyer may catch her eye a few minutes before an event starts. The lack of urgency to attend the events coupled with the lack of communication by friends and flyers has caused her to only attend three events while living at Calvin Court. Her life is pretty busy and separate from Calvin Court. She has her own group of friends outside Calvin Court with whom she regularly meets for coffee. She also does volunteer work at a nearby food bank where she helps to prepare food packages for the homeless. She enjoys working-out and exercises at least four times a week. In her free time she enjoys catching up with friends and family over the phone. She can easily spend three hours just talking to one person.

Rossario

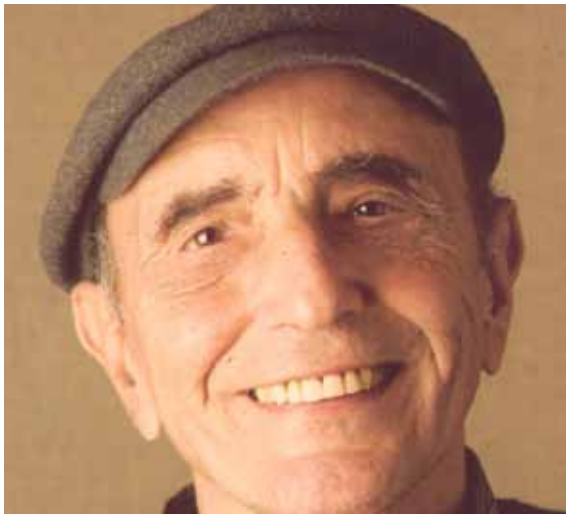
Age: 91
Years at Calvin Court: 20
Limitations: poor hearing, arthritis, minor dementia, no car
Hobbies: Reading



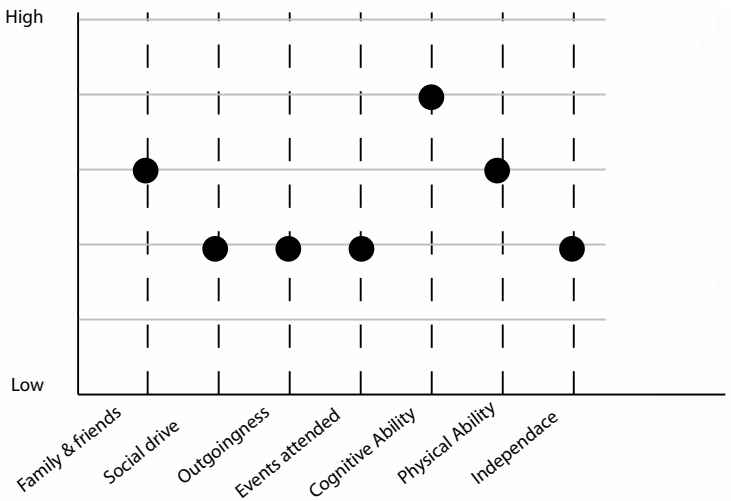
Rossario is a very isolated person. She spends a majority of her time in her room with her cat. She leaves her room to eat in the dining hall three times a day, but does not spend much time talking with others or looking at the environment that she eats in. Instead of interacting with other residents she watches a lot of TV and listens to the radio. She attends mass every Sunday and a few other events that require little to no interaction with other people. Some of her favorite activities are concerts and movies. Despite enjoying these activities she constantly misses events as a result of her isolation. The other types of events she attends are out of necessity which makes her more attentive of trips to places like Kroger or Walmart. When she attends these events she focuses primarily on her tasks and avoids interaction with others. Her prospective in life is indifferent, and she is aware that her quality of life has diminished as a result of physical and cognitive limitations.

She focuses on taking life one day at a time. On special dates like birthdays and holiday she will talk to her relatives over the phone, even though at her age the depth of conversations and interaction with people becomes relatively superficial.

Herold

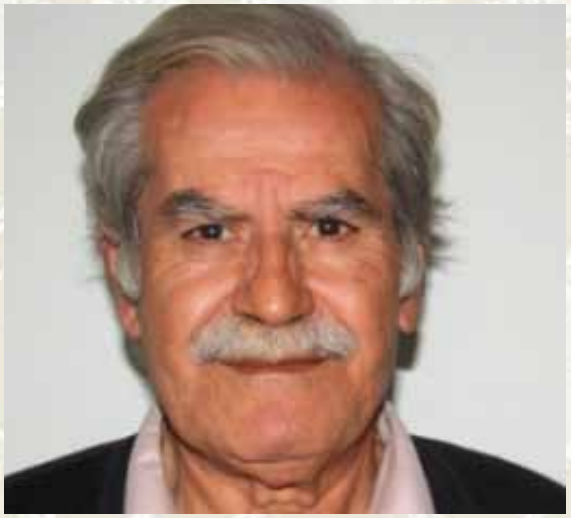


Age: 70
Years at Calvin Court: 3
Limitations: no car, uses a cane, uses glasses
Hobbies: Chess, Reading

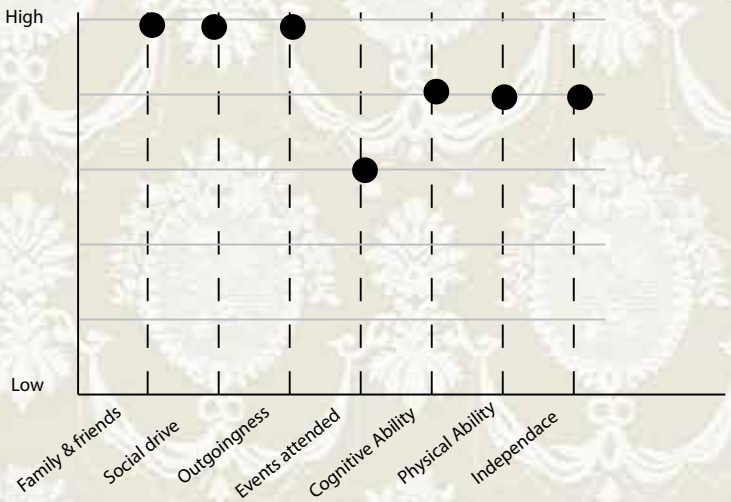


Herold loves learning and sharing ideas. His type of personality attracts him to events where he can express his viewpoints and enter into a conversation with others to expand his own knowledge. He regularly attends coffee time and meets with a group of like-minded friends with whom he chats for hours (way past the scheduled coffee break). He is semi-independent and seeks out concerts and poetry readings that occur outside of the Calvin Court event calendar. He is a regular at the book discussion meetings and attends some of the concerts. His easy going personality makes him very amicable and all the residents are very fond of him. He also has other good friends that reside outside Calvin Court.
In his spare time he loves reading, writing, and playing chess. The last two activities he does on his laptop. He is not computer savvy but knows where to find the Chess computer game, and Word pad on his computer. To him, that's all he needs.

Michael



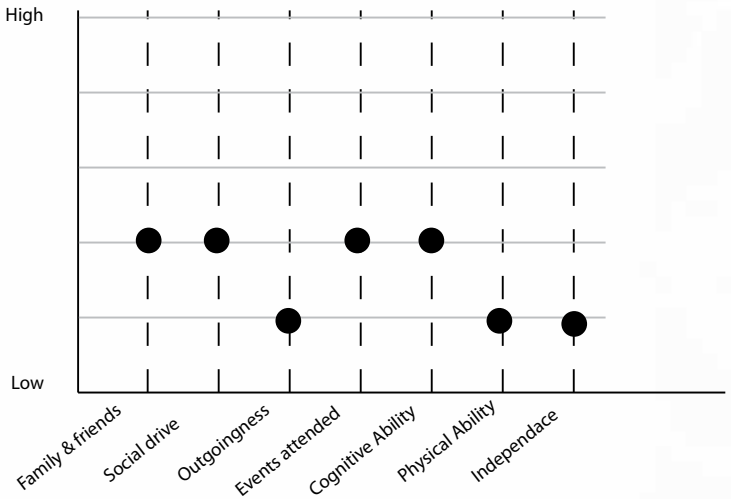
Age: 80
Years at Calvin Court: 12
Limitations: Hand Tremor, uses a cane
Hobbies: Watching sports



Loud and charismatic, Michael's presence is known wherever he is goes. He is involved with several events but rarely keeps the same schedule two weeks in a row. Other residents would say he marches to the beat of his own drum and adds a "breath of fresh air" to an event due to the fact that he often deviates from the topic at hand. Some of the event attendees like this personality trait while others do not think it is appropriate for each event. His attendance habits are out of whim based on his mood, and availability. He looks at the calendar at the start of the day and plans what events he would like to attend that day. He does not plan ahead. The downside of this sporadic behavior is that he never builds on the activity. His inconsistency leads to a lack of knowledge in the event, an inability to participate fully, and often times a misunderstanding of the subject matter. His strong personality causes him to have many friends that really enjoy his company and welcome him in. However, his personality also causes other people to keep their distance and in turn limits his friendships in Calvin Court. In his spare time he loves watching sports and keeping track of sport statistics. He also loves talking about his past achievements.

Elisabeth

Age: 89
Years at Calvin Court: 20
Limitations: wheel chair, poor vision, no car
Hobbies: Religioius activities



Elisabeth lives a routine life. She wakes up early every morning and arrives for breakfast at the dining hall at 8am every day. She greets most everyone since her time at Calvin Court and her predictable routine has made her a good amount of friends. Depending on the day, she might go back to her apartment to watch TV or attend the “coffee breaks” events that Calvin Court schedules. After that she might go back to her apartment to relax for a bit or return to the lobby to sit and converse with other residents. She will also check the calendar to remind herself of any events she might be interested in attending. She consistently attends mass, bingo, and bible study, while keeping a look out for special events that do not require physical activity like concerts or a puppy visit. Her old age has slowed the pace of activities. Her health is not at its best and a few trips to the hospital have deviated her from her routine. The minute she is back in full health she returns back to her regular schedule. Despite her health issues she is a very positive person.

SCENARIOS

To test the prototype the following scenarios were simulated using the prototype. A specific persona is associated for each scenario.

Julie 65 outgoing no limitations:

She volunteers often and the place where she volunteers needs extra help, she takes one of the flyers and uses it to advertise the need at her apartment complex, she adds extra notes by hand to make it more personal.

Elisabeth 85 wheelchair, poor vision

She rarely puts events in and is not tech savvy. However her church is doing an event and pastor coordinated with her to use the device and advertise the event. (the pastor is the one that took the initiative)

Michael.
He constantly reads the newspaper and when he sees a funny cartoon comment he will post it. He does not use it to schedule events but he might try and use it to send an inside notice to his friends that he plans on attending the karaoke night that was scheduled by group of friends

Harold

Doesn't have a car so in an effort to create an event he likes he takes his time to create a think tank event with some of his friends at the apartment complex. He starts by first talking the idea over with his friends but then after it has been solidified uses the device to remind the group and maybe incite some new people to join the event .

Results:
The scenarios helped define some of the details of the concept. For one the proportions for the prototype were appropriate. A final work space dimension of 14" by 16" was defined. Also, finding a comfortable location for the tags in order for the residents to easily read the content was established. The writing utensil has to be secured. For people with walkers or a wheelchair the device needed to be in a place that would accommodate those disabilities. Most importantly the concept provided a good amount of flexibility and was able to accommodate all the scenarios presented.

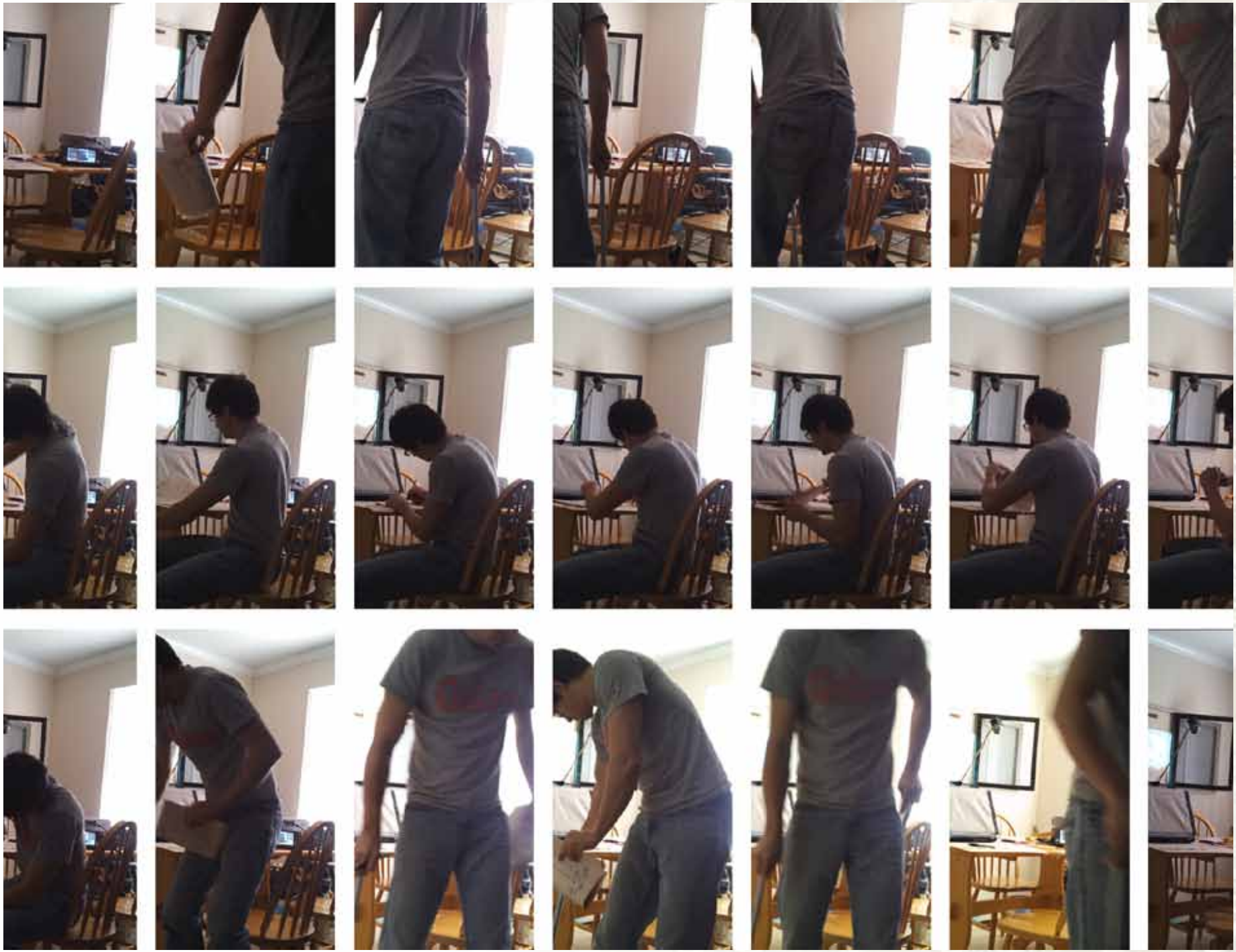


FIGURE 3.10 - Video snapshots of scenario simulation

FOCUS GROUP

Refinement

After verifying the size and feasibility it was possible to explore the aesthetics of the product. Based on the technology portion of the interviews the product would have simple styling and in efforts to provide familiarity inspiration from classic objects like a writing desk would be used to guide the form of the design. Various sketches and form explorations were conducted and the final look aimed at merging a traditional and modern look. The sketches were refined digitally and a 3-D model was generated. With the model complete a physical prototype had to be built to evaluate the concept in a focus group. The model was to have a basic level of functionality and finish but too much that things would already look finished. The incompleteness of the model allows for reviews analyze the general idea and not fixate on the details of the finished product.

With a prototype finished, I scheduled a focus group with about ten Calvin Court residents that consisted of three parts. To begin with the group focused on the initial impression made by the model, and the attendees commented on their observations of the prototype. I took notes on what people thought the product did and if the model looked approachable. Residents with computer experience mentioned it looked like a laptop, which was a decent guess supporting the notion of how previous experience affects expectations. People responded to the aesthetics in a positive way by either liking how the product looked or feeling neutral about it. The second part of the focus group revolved around users interacting with the product. I explained the general idea behind the product and supported the verbal description with a pamphlet that illustrated the functionality. This provided a clearer picture of the prototype and its use. Finally, I had a scripted set of steps enacted by a volunteer using the prototype as a prop. The last step focused on criticizing the design.

FIGURE 3.11- Inspiration for prototype

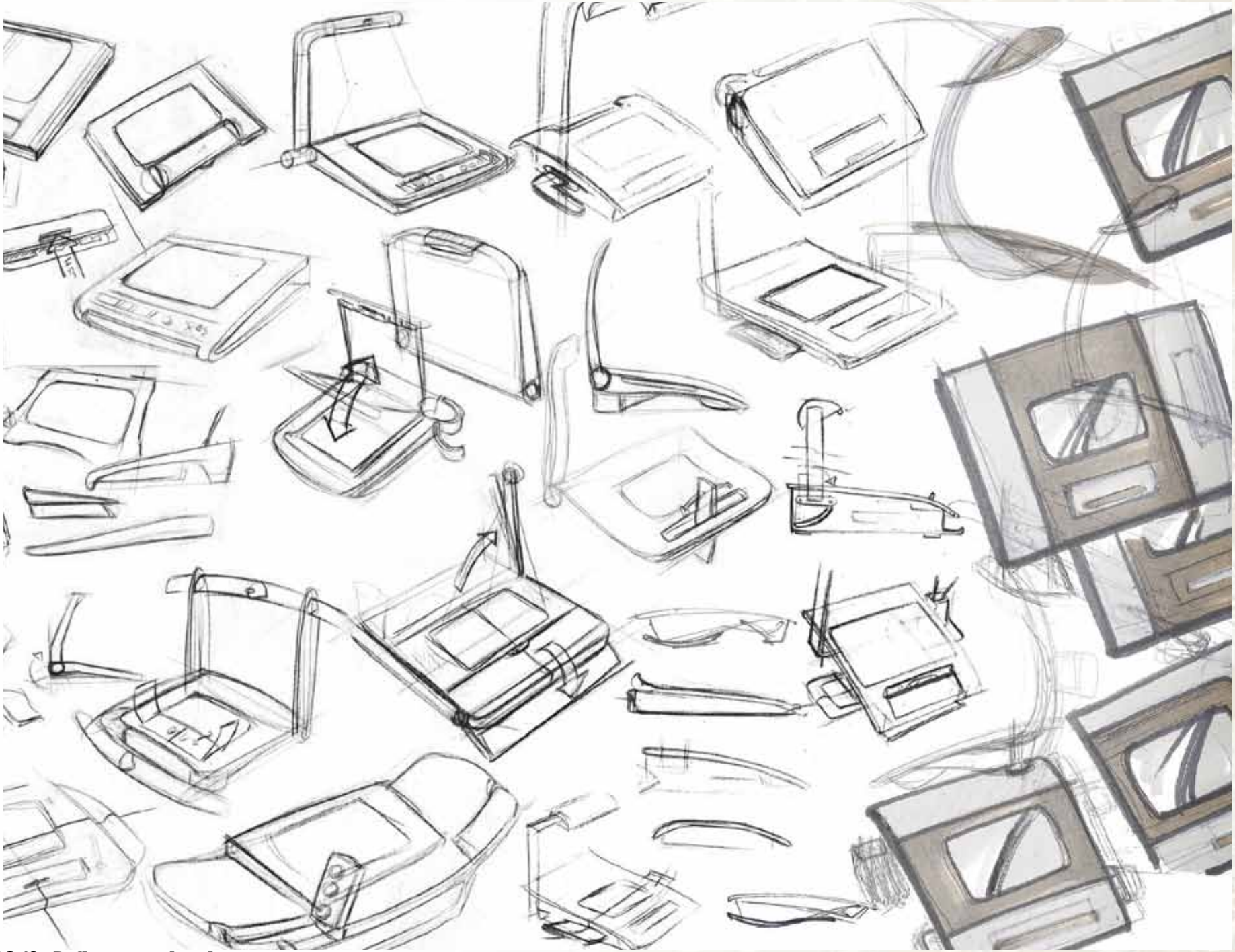


FIGURE 3.12 - Refinement sketches

Here, we discussed ways to improve the product interaction and ideas to consider when implementing the system. The focus group showed a new perspective on the use of the product and resulted in a list of considerations to improve the design.

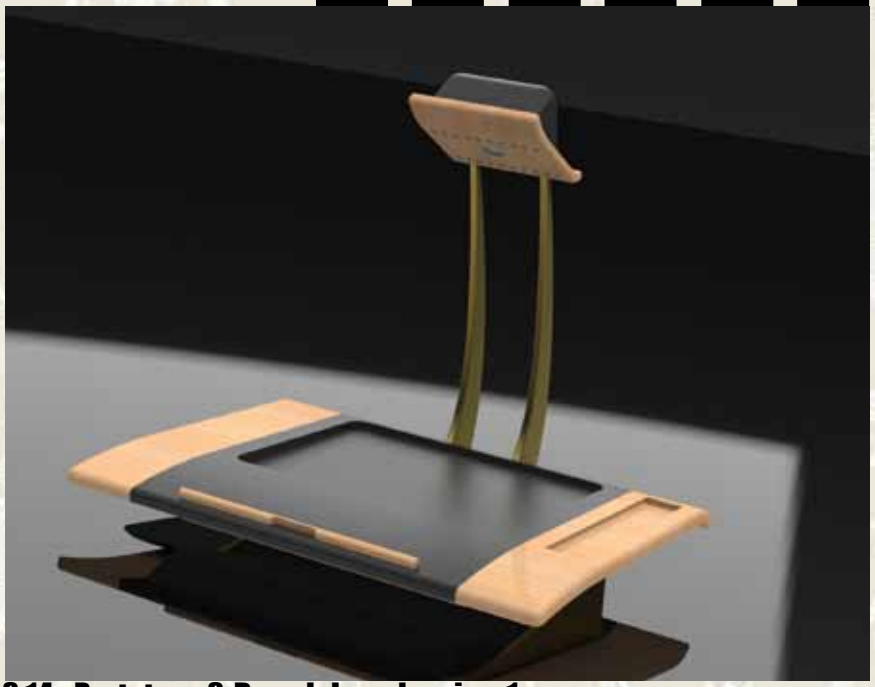


FIGURE 3.14 - Prototype 3-D model render view 1

FIGURE 3.13 - Verifying physical dimension prior to 3-D modeling

FIGURE 3.15 - Prototype 3-D model render view 2

Results

Incorporate a tutorial
Someone needs to be able to explain how to use it in “10 seconds”
Prior experience affects expectations
Incorporate a security to prevent inappropriate postings

FIGURE 3.16 - Prototype for focus group

FIGURE 3.17 - Focus group at Calvin Court

sign and Technologies for Facilitating Events in Retirement Communities

CONCEPT EVALUATION

nitial Impressions

What do you think the product is?
HAS SOME POSSIBL IDEAS

How can the product be used?
PROBABLY WILL BE CONTROLLED BY ADMINISTRATION

Does the product look aesthetically pleasing?

Excellent look	Good look	Neutral	Not so good look	Not good look at all
✓				

What would be a good color(s) to use on the product?
GRAY

What would be some of the materials used?
PLASTIC

1) What do you LIKE about the product?
INTERESTING CONCEPT

2) What do you DISLIKE about the product?
NEEDS A TUTORIAL

3) What would you CHANGE about the product
I DON'T KNOW ENOUGH ABOUT THE PRODUCT TO RECOMMEND ANY CHANGES

Additional Comments:
KEEP WORKING

4) How likely are you to ADOPT this product/concept?

Very Likely ○ Likely ✓ Neutral ○ Unlikely ○ Very Unlikely

Jorge Palacio
May 27, 2012

Georgia Tech School of Industrial Design

FIGURE 3.18 - Sample response from focus group session

Redesign

Form

All the information collected was used to polish and refine the appearance and functionality. Although the look was acceptable by the residents it failed to have a universal appeal since it was designed after comments the seniors had mentioned. Therefore, a new form exploration session was conducted to create a more universally exciting form. Several sketch sessions refined the details further and further until a properly defined model was obtained.

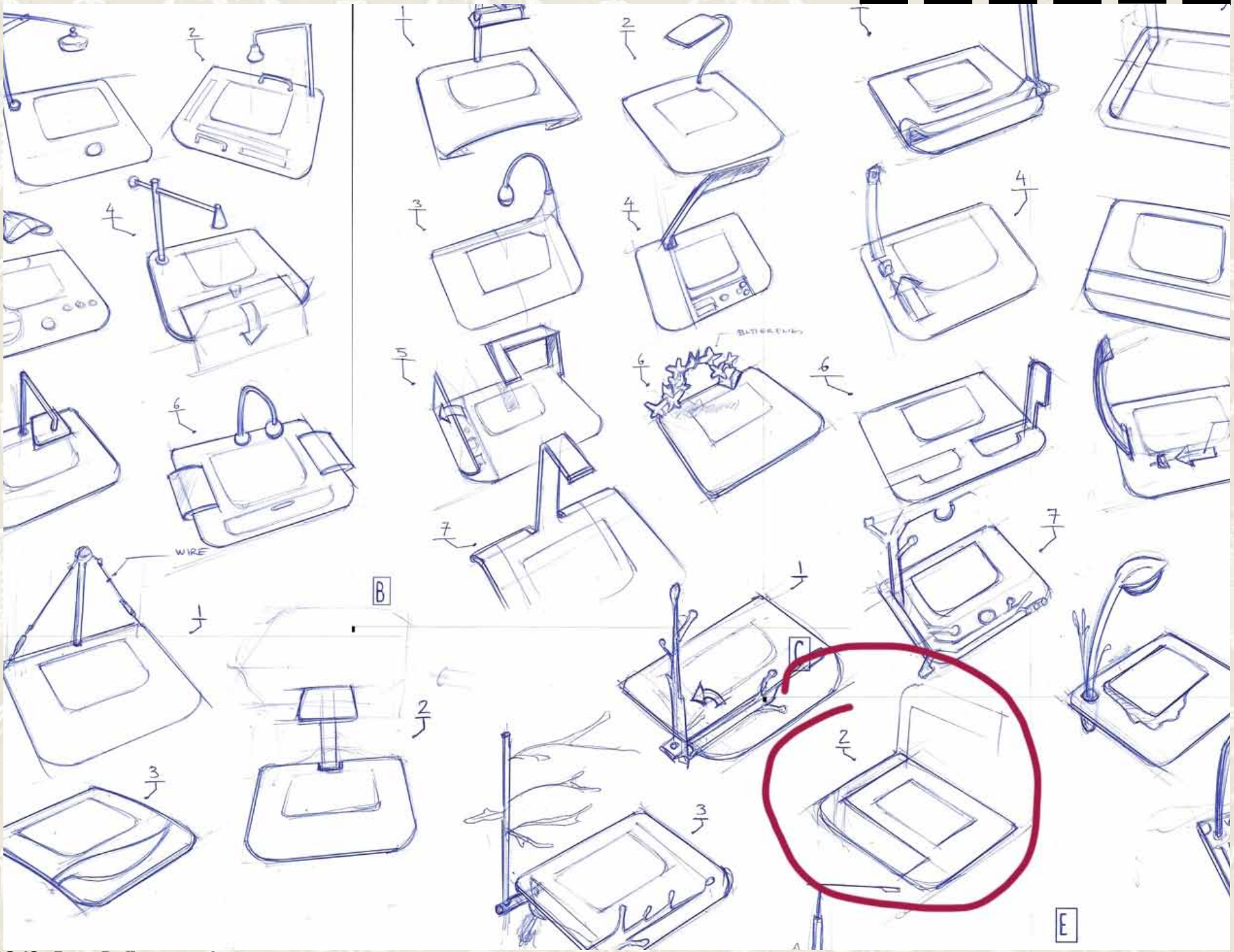


FIGURE 3.19 - Form Refinement 1

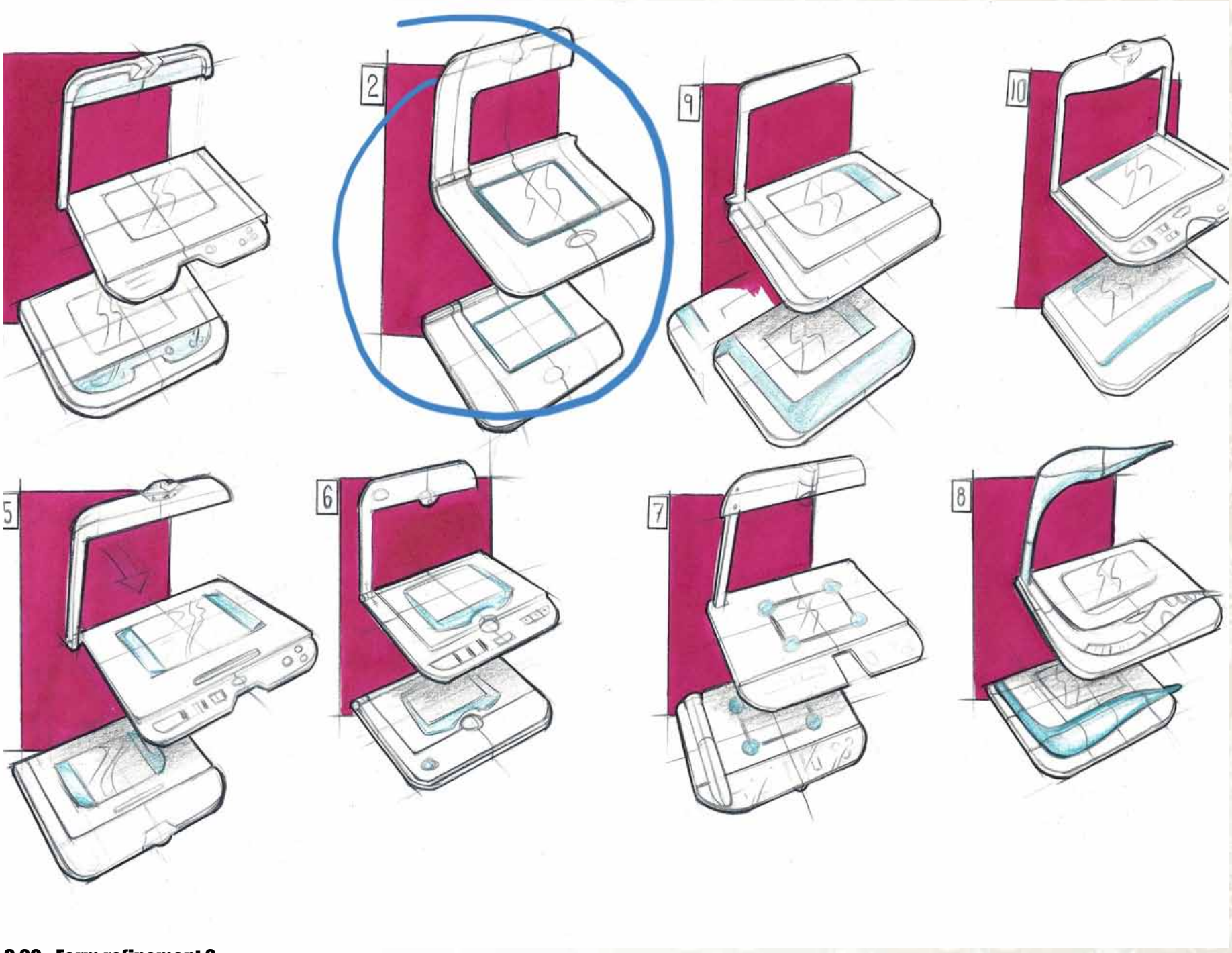


FIGURE 3.20 - Form refinement 2

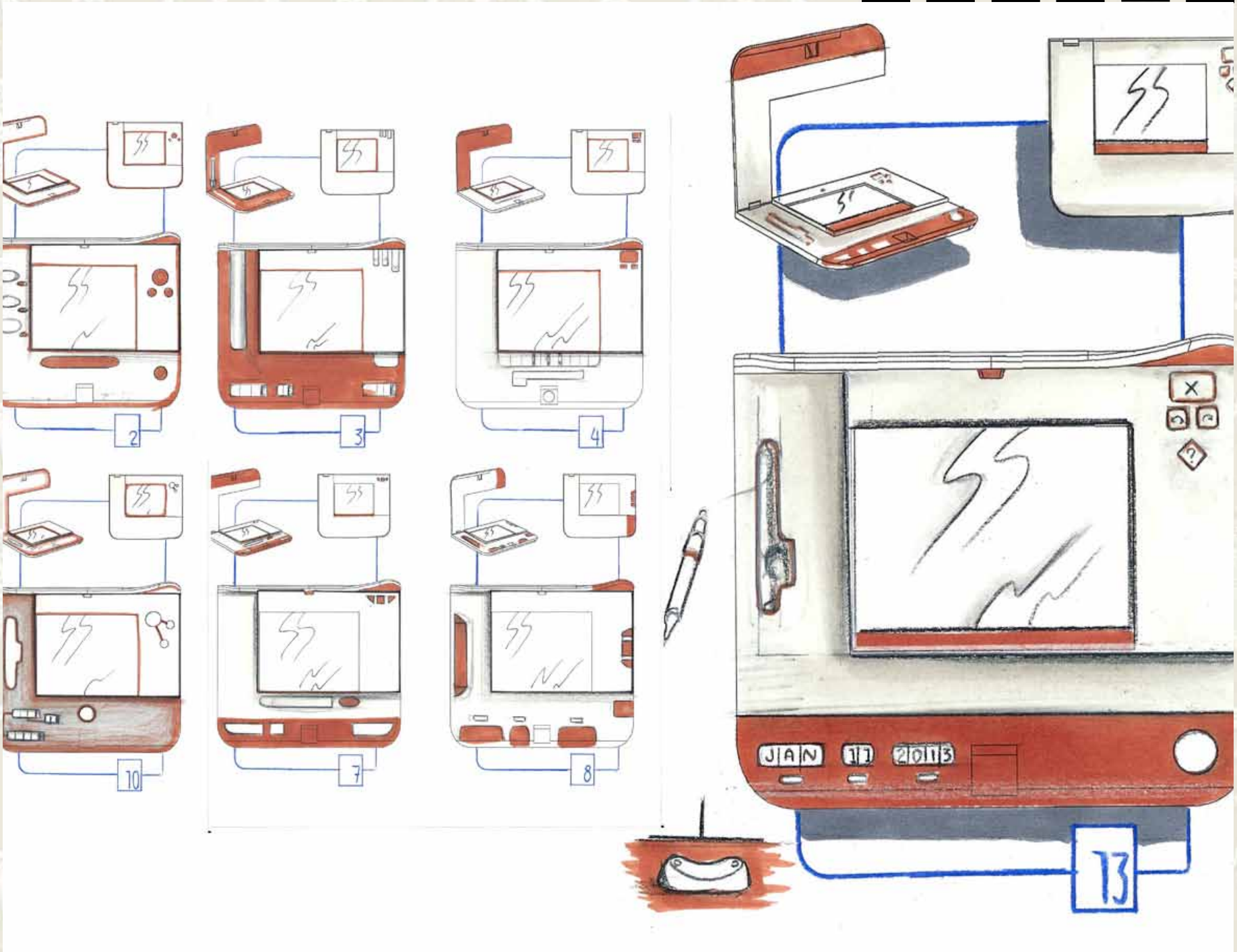


FIGURE 3.21 - Button configurations

FIGURE 3.22- Rough 3-D model of refined concept

Manufacturing

To ensure that the design can be physically built, the assumptions parts would be injection molded was taken. So, all the parts built were designed so they could be created using a two-part mold plastic injection machine. Also, the purchased parts used were measured and modeled accordingly to ensure everything fits. To verify functionality, a cellphone camera was positioned at the height and angle used in the model to verify that everything can be captured and it is not too distorted. E-ink displays were also photographed to test glare and contrast.

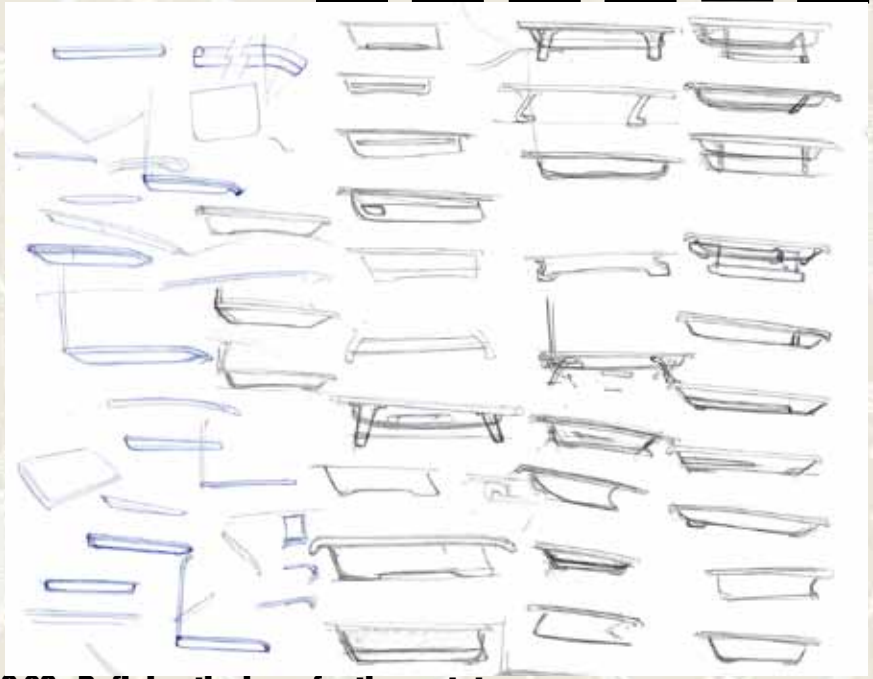


FIGURE 3.23 - Defining the base for the prototype

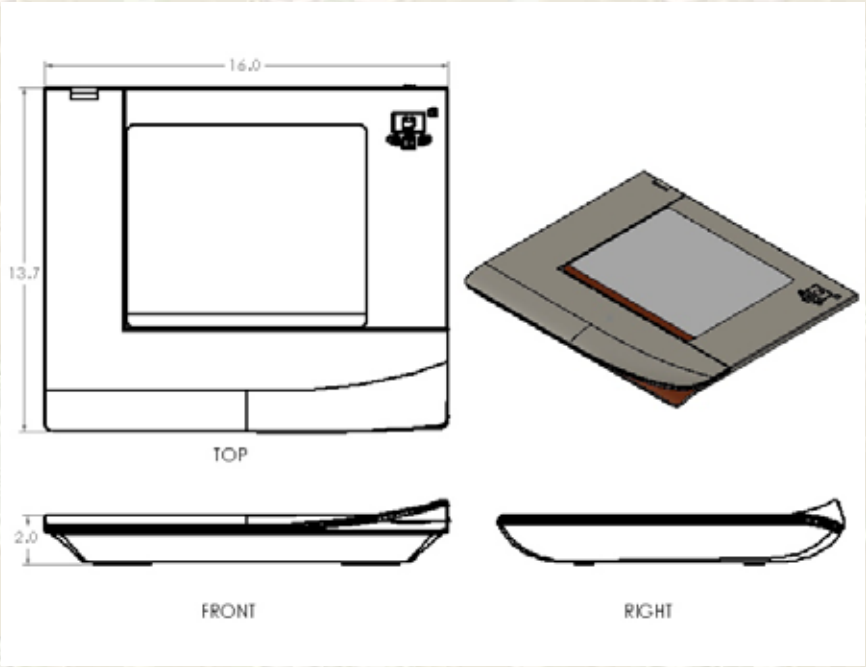


FIGURE 3.24 - General dimensions

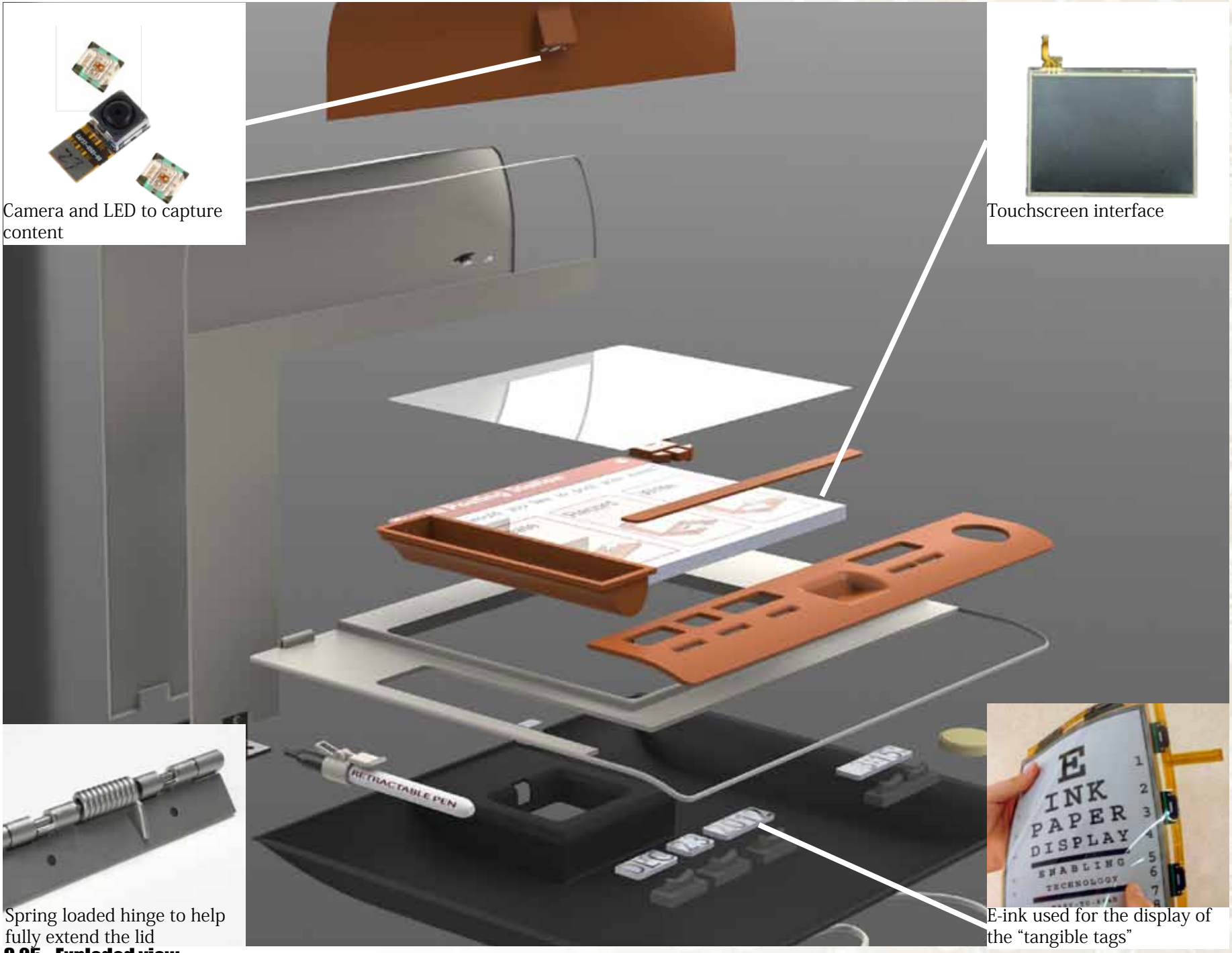


FIGURE 3.25 - Exploded view

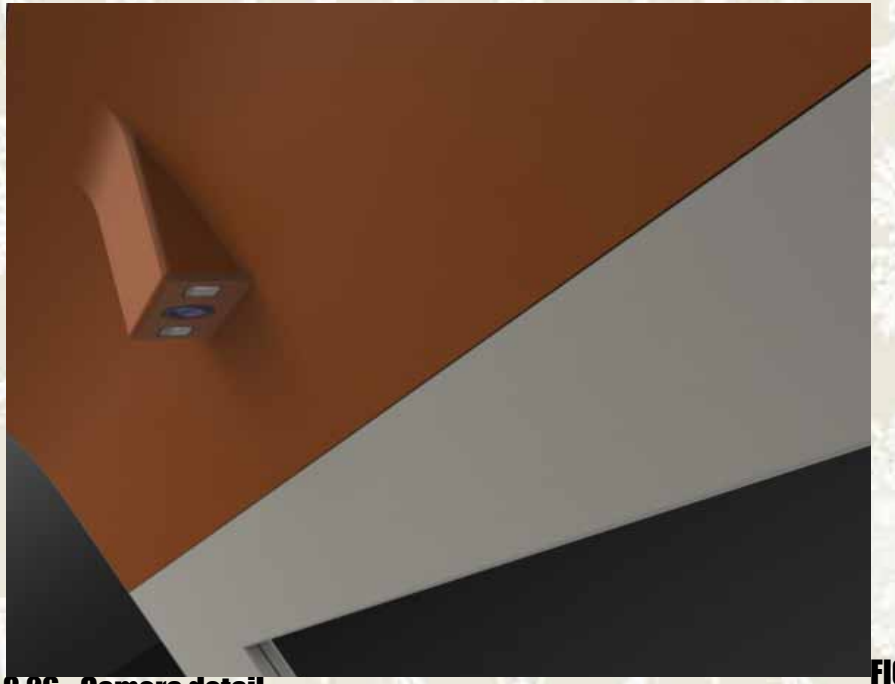


FIGURE 3.26 - Camera detail

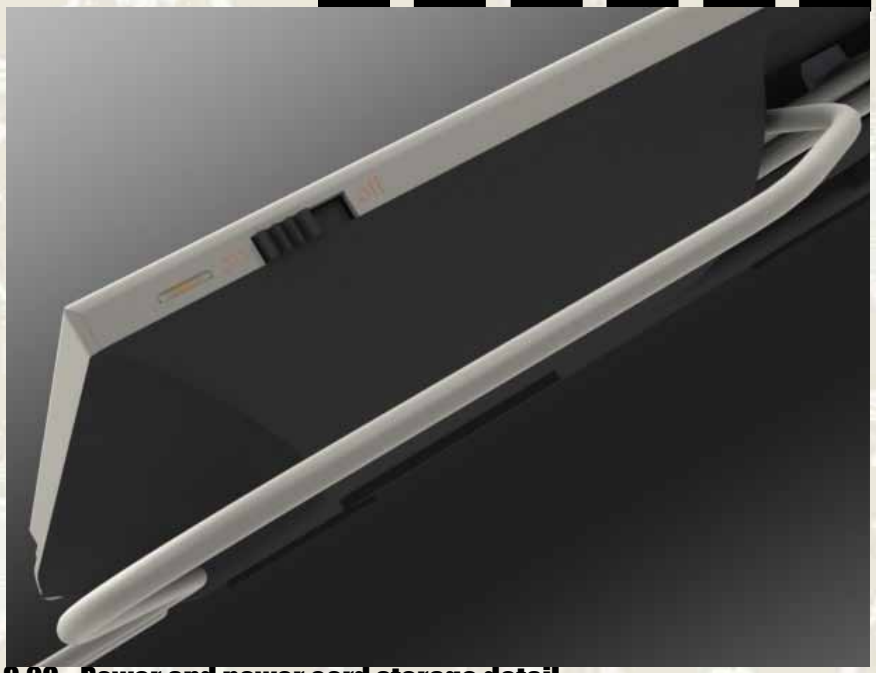


FIGURE 3.28 - Power and power cord storage detail

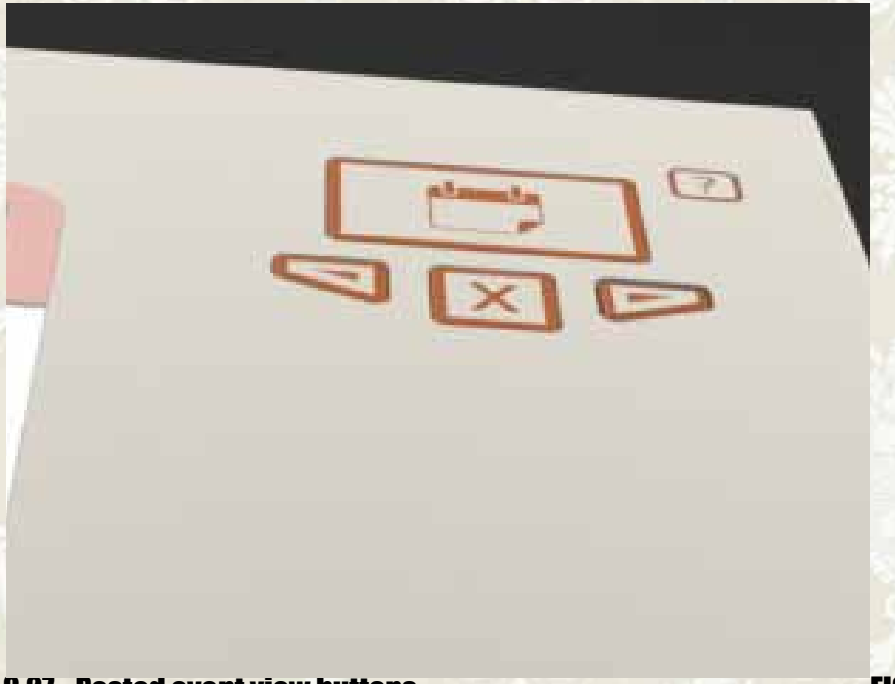


FIGURE 3.27 - Posted event view buttons

FIGURE 3.29 - Bent lip detail

FIGURE 3.30 - Final view rendering

INTERFACE

The software also requires design consideration. Physical operation and software support have to work seamlessly together. To understand this, a software flow chart was created which described all the desired behaviors. This allowed verification of how the software guides physical actions. In addition, the software flow chart shows all the possible software actions and can be used to verify the simplicity of the system. The program focused in providing basic and single functionality. In other words, the program used to post events only focuses on posting events and doesn't provide secondary options like editing events or event viewing. To view and delete events a separate program is used. With the flow diagram completed it was possible to spend some time designing the interface. Three main screens were designed: the home screen, tutorial screen, and the application to post events. To make the program usable high-contrast, images, and video were used. In addition, the Gestalt principles of similarity, continuation, closure, and proximity were applied. Finally, human computer interaction design conventions were used to provide familiarity to the interface.

FIGURE 3.31 - Touch screen interfaces examined

FIGURE 3.32 - home screen view

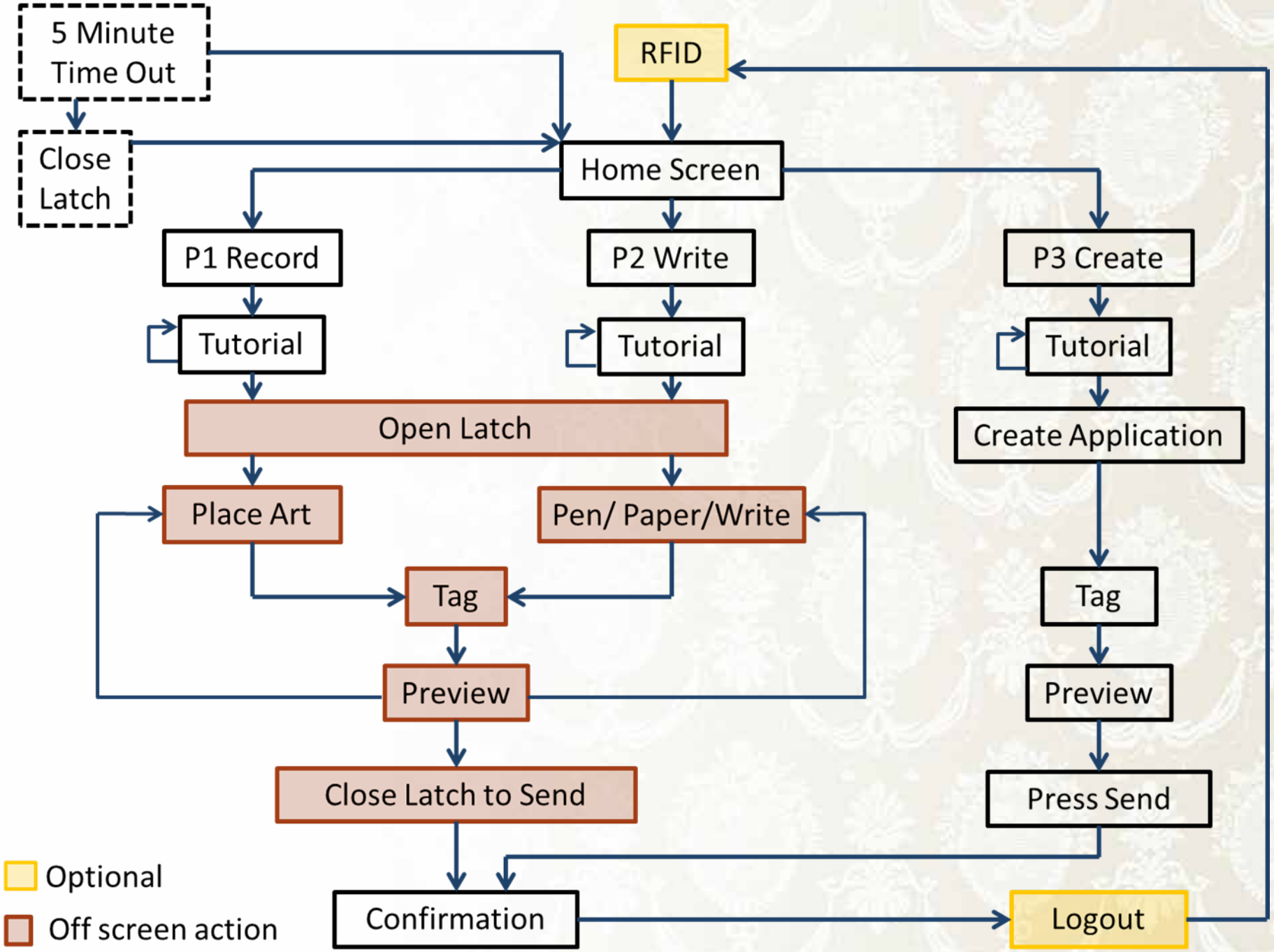
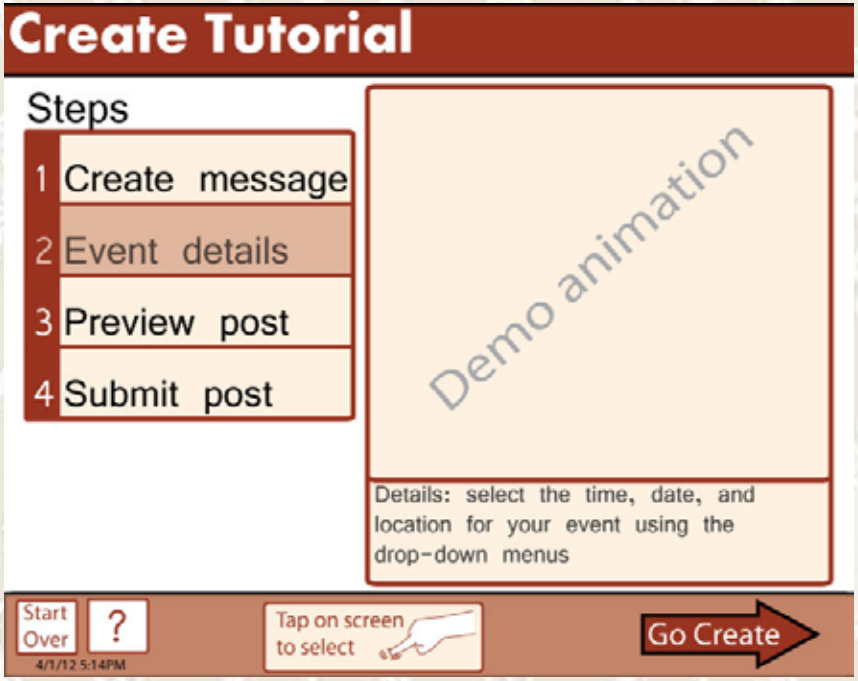


FIGURE 3.33 - Software flowchart



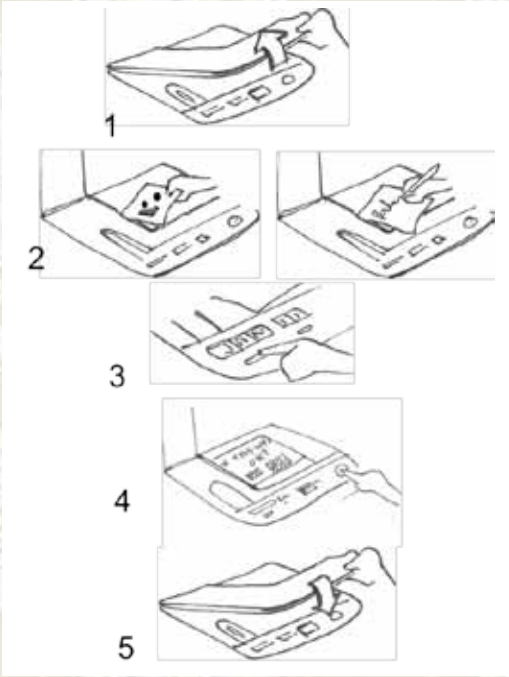


FIGURE 3.34 - Tutorial screen and steps to create an event

FIGURE 3.35 - Steps required to write or place and event

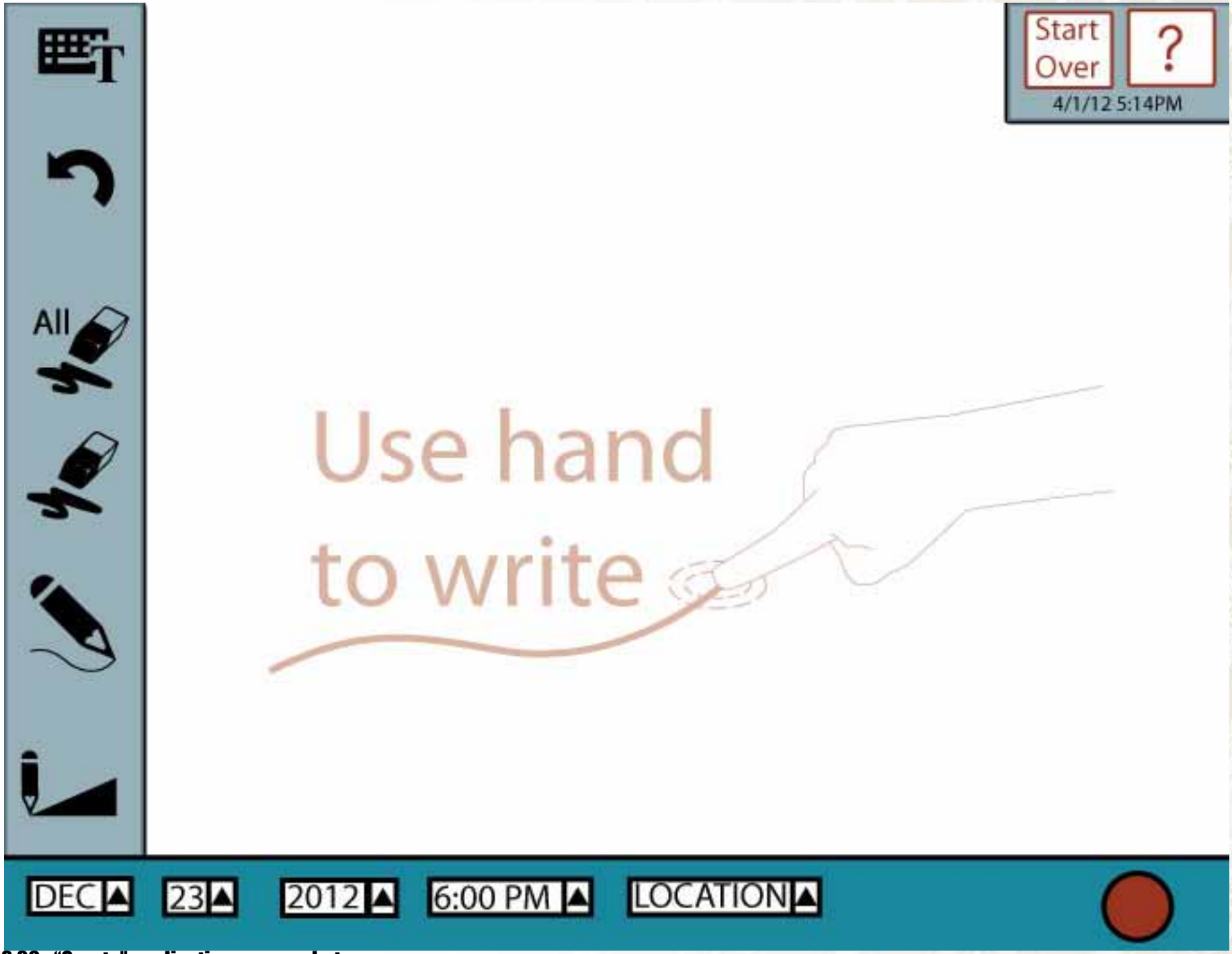


FIGURE 3.36 - "Create" application screen shot

4

EVALUATION

USABILITY

With a high fidelity model completed two tools were used to evaluate it. The first thing was to run a set of scenarios. The scenarios verified the flexibility of the system in accommodating various users and situations. The four scenarios tested and their solutions are presented below:

-Mary wants to share a coupon discount with the community. She brings the newspaper cut out that advertises the word you should mention when checking out. She also needs to add information on how to get to the store.
Solution: She writes the details on a piece of paper and photographs both things together. If space is limited, she can do a second posting with just the details and reference to the initial flyer.

- Bob has molecular degeneration and it is trying to use the interface to share event information. As he is using the interface, he realizes that he forgot the name of the event so he needs to come back to his room to find the information.
Solution: Bob has to start over; however, since the posting process is fast, redoing it shouldn't be a burden

-Susan and Charley want to celebrate their birthdays together and announce it in the community. Susan uses a wheelchair and Charley comes with her to design the invitation. They want to do it together.
Solution: They can make the invitation in a separate location together and use the picture option to post the event.

- Chris decided to publicize a bad gossip in the community. He decided to send an anonymous email to the "event buddy system". He did it when he was angry and he realizes he made a mistake. He wants to erase the message.
Solution: The buttons on the top right corner of the prototype allow users to search the event posted and delete them.

The second evaluation tool was the Universal Design Product Evaluation Countdown Checklist which analyzed if the concept was as usable as possible for people of all ages and abilities. It addressed seven principle of universal design:

Equitable Use
Flexibility in Use
Simple and Intuitive Use
Perceptible Information
Tolerance for error
Low Physical Effort
Size and Space for Approach and Use

The tool grouped statements to verify how the product addressed each principle. Each statement followed a Likert scale that ranged from strongly agreeing to strongly disagreeing. After using the tool, it validated how the concept agreed with all the usability principles. Equitable use was addressed by using an appearance and language that doesn't segregate, provides privacy, and is welcoming to use. Flexibility in use was addressed with the multimodal operation and the ability to use it at one's own pace. Simple and intuitive use was addressed by providing familiarity and affordances. Also, the software was simple and clear allowing users to perform tasks with a minimal amount of steps. Perception information was addressed with the use of tutorials, color coding, and high contrast. However, the system doesn't provide audio support which prevents blind people from using it. But, that feature could be incorporated later on if testing shows it's a critical feature to have. Tolerance for Error was addressed by providing the option to go back, showing a preview before posting, and the ability to delete postings. Also, the location of buttons is in accordance with the steps which helps reduce error. Low physical effort was addressed by providing easy to grab surfaces like the bent lip, a spring loaded hinge to assist raising the lid, and using a marker instead of a pen to make it easier to write.

Finally, the size and space for approach and use was addressed with paper prototypes and the focus group which verified the size was large enough without being intrusive.

To summarize, each question in the check list was given a score from 1 to 5 (5 for strongly agree). After all the questions were answered, the design totaled 118 out of 145 possible points. This rated the design as being agreeably usable.

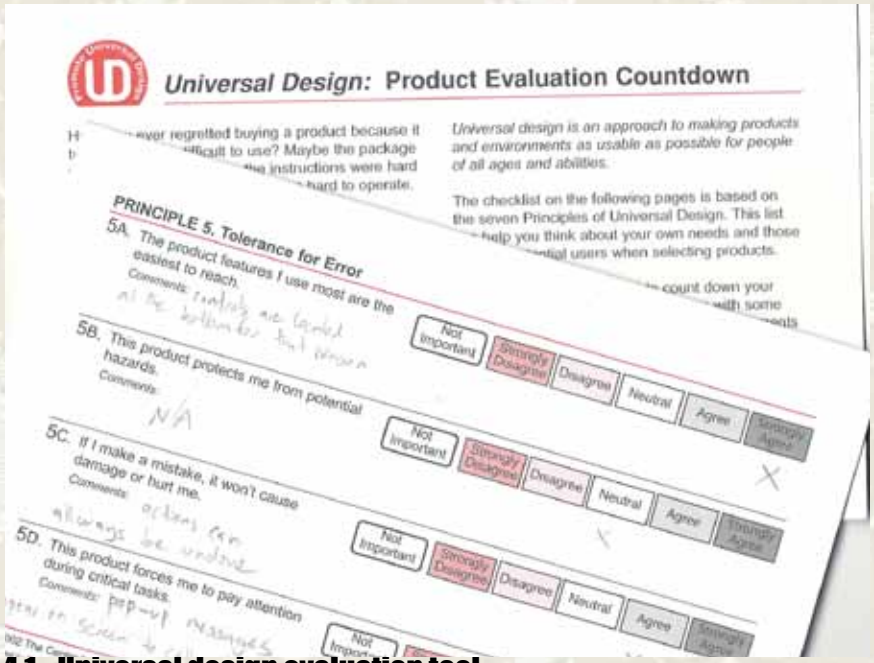


FIGURE 4.1 - Universal design evaluation tool

USER TESTING

FIGURE 4.2 - Beginning of fabrication

With all the details defined it was possible to build a new prototype that had a high level of fidelity. The final model replicated the size, form, and color almost perfectly and the use of a tablet provided some functionality of the software. This prototype was ideal for public evaluation because it was detailed enough that it wasn't necessary to explain how the product functioned.

Once finished the residents at Calvin court evaluated the prototype. Once they established interest in the product I asked residents to draw a happy face using the tablet or the paper interface. Everybody that used the product liked it. The affordances the prototype provided made the use intuitive. For instance, everyone grabbed the bent corner to examine if it opened. Also, people were selecting the right buttons without the need of direction. The prototype also accounted for various disabilities. People with wheelchairs were able to use it comfortably, and people with arthritis liked the marker because it made it easy to write. To see how the product fits in the environment, the prototype was placed in various locations. The size and weight allowed for placement in many places without it becoming a hindrance. Also, from a visual stand point, the concept worked with the décor and provided a balance between blending and standing out. Overall, everybody liked the prototype and found it easy to use. However, to properly validate the design a fully functional model is required. This will allow users to fully operate the device independently without my support which was required to compensate for the limited functionality of the prototype. Also, posting actual events changes the experience. Some residents had a shaky hand when drawing the happy face which might mean handwriting legibility might be a problem for those users when they try and post events.

FIGURE 4.3 - Fabrication process

FIGURE 4.4 - Final prototype

FIGURE 4.5 - General acceptance of the prototype

FIGURE 4.7 - Using the “create” interface

FIGURE 4.6 - Providing accessible access

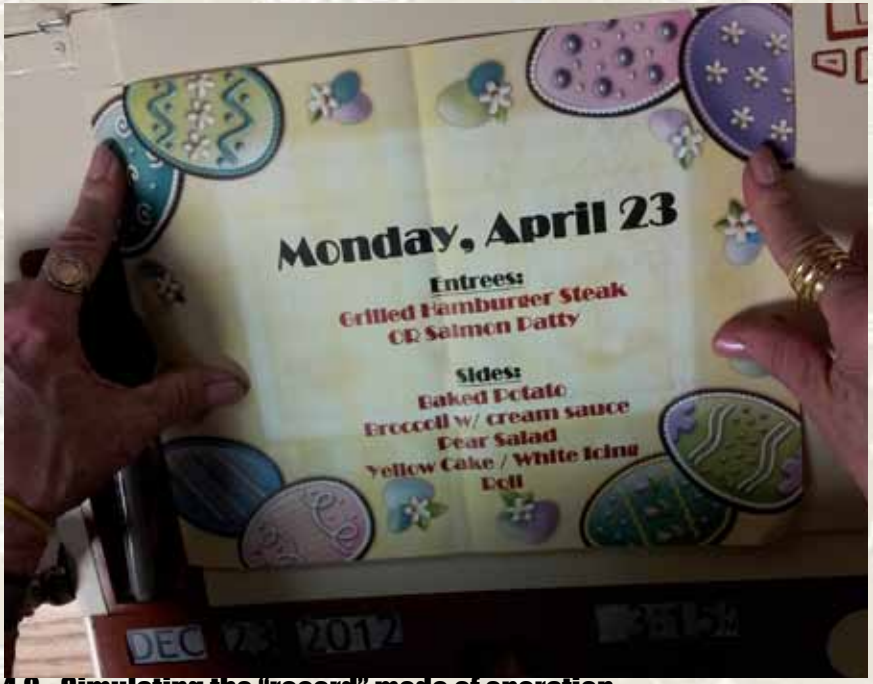


FIGURE 4.8 - Simulating the “record” mode of operation

5

FINAL THOUGHTS

OUTPUT

With the input at a satisfactory state, it was possible to explore how the output would operate. The first iteration models the output as a passive device. This means users don't interact with the device. The output filters the content automatically, and cycles the events in prescribed fashion. Events cycle in 10 second intervals and only the events that are happening that day, the next, or have been recently posted will appear on screen. In the addition, the use of sound, light, and movement are incorporated to help indicate details about the data displayed. For example, events that are happening that day will cause a part of the device to light up green. This will tell residents the date of the event without having to read it. Visually, the output device will have a design language similar to the input. For the size and location, the output is about 20" by 20" and it is to be placed by the elevators. Unfortunately, this is the first iteration of the output device; therefore, a lot of the design decisions require validation. The time frame of the project limited the amount of exploration for this area.

FIGURE 5.1 - Form exploration for output display

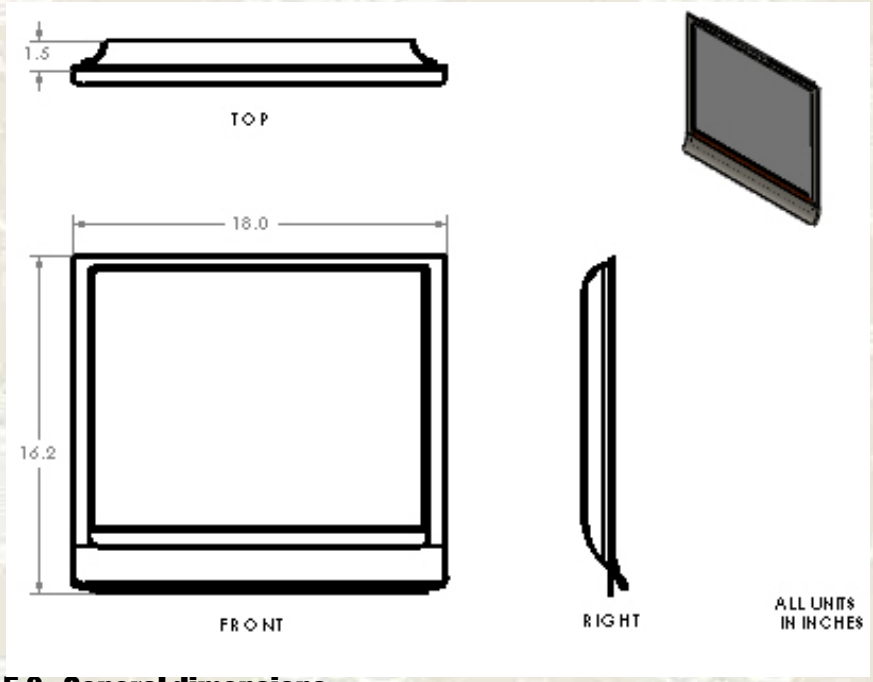


FIGURE 5.2 - General dimensions

FIGURE 5.3 - Final rendering of output display

CONCLUSION

This project demonstrated the development of a design process that took an observation and, with the use of a structured methodology, generated a novel solution. The process showed how ideas undergo multiple iterations and constant refinement. Suggestions were constantly tested and evaluated to eventually derive a final product. This process also showed the importance of collaborative work. The feedback from my peers, adviser, and residents and staff from Calvin Court inspired ideas that contributed to my final solution. The final product is a two part system that empowers residents to share their knowledge of events. It focuses on the intuitive use of technology by using affordances and familiarity. The input station provides a fast, flexible, and simple way to post events, while the output filters the content displayed and reduces the mental workload of scanning a calendar. As an end goal, the system aims to enrich the lives of seniors in senior housing facilities and expand the independence of seniors leading to a better quality of life.

FIGURE 5.4 - Proposed solution